

REV. W. HOUGHTON.

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COUNTRY WALKS OF A NATURALIST

WITH

HIS CHILDREN.

BY

REV. W. HOUGHTON, M.A., F.L.S.,

RECTOR OF PRESTON ON THE WILD MOORS, SHROPSHIRE.

ILLUSTRATED WITH EIGHT COLOURED PLATES AND
NUMEROUS WOOD ENGRAVINGS.

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PREFACE.

IN this little book my desire has been, not so much to impart knowledge to young people, as to induce them to acquire it for themselves. I have endeavoured to show that Country Walks may be full of interest and instruction to all who care to make good use of their eyes. If I have failed, the fault rests with me for the way in which I have treated the subject. I am aware that I have occasionally used words and phrases which may puzzle young brains, but I hope that nearly all will be intelligible to boys and girls of nine or ten years old, with a little explanation from parents or teachers.

The chief, if not the sole merit of this little book consists in the illustrations which adorn it; and I must express my sincere gratitude to Mr. Gould, the eminent ornithologist, for his

kind permission to copy some of the magnificent drawings in his work on 'The Birds of Great Britain.' To Mr. R. S. Chattock, of Solihull, I am also deeply indebted, for the pains he has taken in reproducing, on a reduced scale, Mr. Gould's drawings, and for the drawings of the sticklebacks and the frontispiece. My generous friend and neighbour, Mr. Eyton, of Eyton, has furnished another instance of his numerous acts of kindness, in allowing me the use of Mr. Gould's work and of various woodcuts. To two lady friends I also express my best thanks; and last, though not least, to the publishers, Messrs. Groombridge, for the care they have taken to present the volume to the public in a very attractive form.

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COUNTRY WALKS OF A NATURALIST

WITH

HIS CHILDREN.

WALK I.

APRIL.



WE could not have a more pleasant day, children, for a ramble in the fields than to-day. It is warm and bright, and the birds are singing merrily, thoroughly enjoying the sunshine; the little lambs are frisking about, and running races with each other. Put away lessons then, and we will have a holiday. "Oh," said Willy, "it will be so pleasant, and I will take one or two bottles, and my gauze net, because we are sure to find something interesting to bring home. Where shall we go?" "I do not think it much matters where, for there is always much to observe and to admire wherever we stroll in the country." "Let us go on the moors, then," said Jack, "for you know, papa, a little boy in the village told me the other day he had found a peewit's nest with four eggs in, and I should like to

try and find one myself." Well, here we are, then; we shall have to jump over a drain or two in our ramble, and as the banks are soft it will be necessary to take great care, or we may tumble in. Ah! do you see, there are two sand-martins, the first I have seen this year. See how fast they fly, now sailing high up in the air, now skimming quite close to the ground. I have not seen any swallows or house-martins yet, but no doubt they will make their appearance in a few days. "Where do they come from, papa," asked May, "because we never see these birds in the winter? You often say, when the spring comes we shall see the swallows, and then they go away again towards the end of summer." Let us sit down on this clump of wood, and I will tell you about the swallows.

We have in this country four different species of the swallow family which visit us every year; they come to us from Africa: these are the sand-martin, two specimens of which we have just seen, the swallow, the house-martin, and the swift. A very little attention will enable you to distinguish these different kinds. The sand-martin is the smallest of the family; as the birds fly by us you notice that the back part is brown, or mouse colour; the under part white. The back of the house-martin is of a glossy black or bluish-black colour; it is white underneath; while the swallow, which is larger than the other two, has a glossy back, like the house-martin; but underneath it is more or less tinged with buff; and see, as I speak here is one flying past us. To-day is the 12th of April, about the time the swallow generally comes to this country. Now you

see clearly enough its colour, and you will notice, too, a very marked difference in the form of its tail; see how much forked it is, much more so than the tail of the martin. This forked appearance is produced by the two outer tail feathers, which are much longer than the rest. Now I hope you will take notice of these differences, and call things by their right names, instead of jumbling them all up together under the name of swallow. I have not spoken of the swift, which does not visit this country till May; it is the largest of the swallow family, and has the whole of its body, both above and beneath, of a blackish-brown colour, except a small patch of dirty white under the chin.

“But, papa,” said Jack, “do all these four kinds of swallows come from Africa? It is very curious to know how they can find their way backwards and forwards from Africa to this country, and how they come back to the very spots they visited the year before?” Indeed, it is a very curious thing; nevertheless experiments have been made to show that these birds return every year to the same localities.

Many years ago Dr. Jenner procured several swifts from a farmhouse in Gloucestershire, and marked them by cutting off two claws from the foot of twelve of them. Next year their hiding places were examined in the evening, when the birds had gone to roost, when Dr. Jenner found many of the birds he had marked by cutting off the two claws. For two or three consecutive years he examined their nesting places, and always found some of his marked birds. At the end of seven years a cat brought a swift into the farmer’s kitchen,

and this was one of those which Dr. Jenner had marked. Now, Willy, I will ask you a question in geography. The swallow family visits this country from Africa. What sea, then, must the birds fly across? "The Mediterranean, papa." Quite right; and now can you tell me the narrowest part of the Mediterranean Sea? "The Straits of Gibraltar." Right again; and there the passage is about five miles wide; and at Gibraltar swallows, swifts, and martins are often seen as well as several other bird-visitors of this country. People on board ship have seen swallows a long way from land passing between Europe and Africa. Sometimes the poor birds are so tired from their flight that they are obliged to rest on the masts, yards, and rigging of the vessels. This often happens when the weather is hazy. Holloa, Jack, what is that splash in the water about six yards off? Keep quiet, and we shall see what it was. Ah! it is one of my friends, the water-voles; I see the rogue, with his large yellow teeth and black eyes. Do you see? He is on the other side of the drain, nibbling away at something. People generally call him a water-rat, but he is no relation at all to a rat, nor is he an injurious creature like it. "Well, but papa," said Willy, "the lads in the village always kill these water-rats, as they call them, whenever they can. I suppose they take them for common rats. Do you say they do no harm?" Very little, water-voles will not eat young chickens and ducklings; nor do they find their way into stacks and consume the corn; their food is entirely confined to vegetables, such as the roots and stems of water-weeds. I feel, however,

pretty sure that the water-vole is fond of beans, and will occasionally do some mischief where a field of newly-sown beans adjoins the river or stream, in the banks of which these animals form their holes. I will clap my hands, and off our little friend with his dusky coat starts, diving under the water, whence when he comes out he will probably escape into a hole on the bank. Some day I will show you the skulls of a water-vole and a rat, and you will see there is a great difference in the form and arrangement of the teeth, and that the first-named animal is not, as I said before, related to the rat. The water-vole is really a relative of that interesting creature you have often read of—I mean the beaver. “Well, papa,” said Jack, “I am tired of sitting here, let us now go and hunt for peewit’s eggs.” All right, Jack, and if you find any you shall each have one for your breakfast in the morning. When hard-boiled and cold, a peewit’s egg is a very delicious thing, though I think the pecwits are such valuable birds, and do so much good, that I should not like to take many of their eggs. We had better separate from each other, so as to have a better chance of finding a nest. Soon we hear a shout from Willy, whose sharp eyes had discovered a nest with four eggs in it; so off we all scamper to him. See how the old bird screams and flaps, and how near she comes to us; she knows we have found her eggs, and wishes to lure us away from the spot; so she pretends she has been wounded, and tries to make us follow after her. Now, Jack, run and catch her. Hah! Hah! There they go. I will back the peewit against the boy. So you have given

up the chase, have you? Well, rest again, and take breath. The peewit, as you saw, makes scarcely any nest, merely a hollow in the ground, with, perhaps, a few dried grasses. The peculiar instinct of the peewit in misleading people as to the whereabouts of its eggs, or young ones, is very curious. A very observant



LAPWING.

naturalist says, "As soon as any one appears in the fields where the nest is, the bird runs quietly and rapidly in a stooping posture to some distance from it, and then rises with loud cries and appearance of alarm, as if her nest was immediately below the spot she rose from. When the young ones are hatched, too, the place to look for them is, *not* where the parent birds are screaming and fluttering about, but at some little distance from it. As soon as you actually come to the spot where their young are, the old birds alight on the ground a hundred yards or so from you, watching your movements. If, however, you pick up one of the young ones, both male and female immediately throw off all disguise, and come wheeling and screaming around your head, as if about to fly in your face." Peewits are certainly bold birds when their young ones are in danger. Mr. Charles St. John says he has often seen

the hooded crows hunting the fields frequented by the peewits, as regularly as a pointer, flying a few yards above the ground, and searching for the eggs. The cunning crow always selects the time when the old birds are away on the shore. As soon as he is perceived, however, the peewits all combine in chasing him away. We are told that they will also attack any bird of prey that ventures near their breeding ground; they are quarrelsome, too, and the cock birds will fight with each other should they come into too close quarters. A cock bird one day attacked a wounded male bird which came near his nest; the pugnacious little fellow ran up to the intruder, and taking advantage of his weakness, jumped on him, and pecking at his head, dragged him along the ground as fiercely as a game cock. This was witnessed by Mr. St. John.* “I have often heard peewits uttering their peculiar noise,” said Willy, “quite late at night. What do they feed on? I should so much like to have a tame young one.” The food of the peewits consists of insects, worms, snails, slugs, the larvæ of various insects; I am certain they do much good to the farmer by destroying numerous insect-pests. “Oh, papa,” exclaimed May, “do come here, what a splendid cluster of bright golden flowers is growing on the side of the drain.” Yes, indeed it is a beautiful cluster; it is the marsh-marigold, and looks like a gigantic buttercup; it is sometimes in flower as early as March, and continues to blossom for three months or more. Country people often call it the may-flower, as being one of the flowers once used for

* ‘Wild Sports of the Highlands,’ p. 136.

may-garlands. I dare say you have sometimes seen wreaths hanging on cottage doors. Some people have invented what I think very ugly names for this showy plant, such as horse-blob, water-blob.

“Beneath the shelving bank’s retreat
The horseblob swells its golden ball.”

I have somewhere read that the young buds are sometimes pickled and used instead of capers, but I do not think I should like to try them. “And what,” asked May, “are those bright green feathery tufts under the water? they are very pretty, but they do not bear any flowers.” No, there are no flowers at present, but in about a month’s time you will see plenty. Out of the middle of the feathery tuft there grows a single tall stem with whorls of four, five, or six pale purple flowers occurring at intervals. Its English name is water-violet,—not a fitting name for it, because this plant is not at all related to the violet tribe, but is one of the primrose family; so we should more correctly call it water-primrose. Its Latin name is *Hottonia palustris*; it is called *Hottonia* in honour of a German botanist, Professor Hotton, of Leyden. Willy will tell us that the word *palustris* means “marshy,” in allusion to the places where the water primrose is found growing. It is a very common plant in the ditches on the moors here, and I will take care to show you its pretty tall stem when the flowers appear. While I was talking to May about the water primrose, Jack espied a sulphur-coloured butterfly, and off he set in full chase; he did not, however, succeed in capturing it, for his foot tripped

over a molehill and down he tumbled—the beautiful sulphur butterfly having fled across a wide ditch and escaped. Not far from where he fell there was a thorn bush and a number of unfortunate moles gibbeted thereon : some had been killed quite recently, so I took three or four from the thorn with the intention of taking them home and examining their stomachs to see what they had eaten. In the meantime, down we sat on an adjoining bank covered with primroses looking so gay and smelling so sweet. Willy then wanted to know the history of the mole ; why people generally think it right to kill these animals, and whether they really are blind. May, of course, could not resist the charm of collecting primroses for mamma. The two boys cared more for animals, so I answered their questions about the mole. First of all I pointed out the amazing strength of its feet, its soft and silky fur, the form of its body so well adapted for a rapid progress through the underground passages it forms. Look, I said, at its soft fur, how it will lie in any direction ; each delicate hair is inserted in the skin perpendicularly to its surface, so that the mole can move rapidly either backwards or forwards with great ease ; the fur, lying as readily in one direction as another, makes no difficulty to a backward retreat. If you look closely when I push away the fur with my finger and breath in the neighbourhood of the eyes, you will see two tiny black specs ; so we can hardly call the mole a blind animal ; but as it lives for the most part underground its power of vision must be small. The fore feet do the work of the spade and potato-fork combined ; its sense of smell is acute, and

this, no doubt, aids the animal in the search of its food; the mole's sense of hearing is also very good. "Well, but, papa," exclaimed Jack, "a mole has got no ears, so how can it hear?" There is no outward appearance of ears, it is true, but look: I blow away the fur, and now you see clearly a hole which is the beginning of the passage that leads to the internal ear. The ears of many animals are very admirably made and fitted for the purpose of receiving sounds, but you must not suppose that because some animals—as moles, seals, whales, &c.—have no outward appendages, they are destitute of ears and the power of hearing. But you must wait till you are a little older, and then I will explain to you the matter more fully. The little curiously shaped earbones which are found in all mammalia are found also in the mole; and I have in my drawer at home a mole's ear-bones which I dissected from the animal.

But here comes, I do think, the mole-catcher himself; let us hear what he has to say. "Good morning, Mr. Mole-catcher; have you been setting any more traps to day? I suppose those unfortunate fellows gibbeted on yonder thorn were caught by you." "Well, yeez, sir," he replied, "I reckons as they were; I have stopped their play, I guess; but there's a plaguey lot more on them about, I'm a thinking." "What harm do you consider that moles do?" I asked. "Harm, maister? why, lor' bless you, see them hummocks they throw up all about. The farmers dunna like them ugly heaps, I can assure you." "Probably not; still if they were spread on the land the soil would be as good as

top-dressing. Do you know what moles eat?" "Well, sir, I believe they eat worms." "Yes, they feed principally on worms, but they also devour wireworms and other creatures which prey upon the farmer's crops. I think moles do more good than harm, and I have examined the stomachs of many, and I am of opinion that it is a mistake to kill them." "Lor', sir, you be's a gemman that has seen the inside of a mole's stomach, has you? You may be a cliver sort of a mon, but moles be varmint." Thus saying, the old fellow wished us good morning and left us. "Papa," said Willy, "do not moles make very curious places under the ground in which they reside at times? I think I have somewhere seen pictures of these encampments." Yes, they do; but I only know of them from description and figures; the fortress is generally made under a hillock; it consists of many galleries connected with each other, and with a central chamber. You remember a young mole was brought to us last summer, and that we put it into a box with plenty of loose earth and some worms. We only kept it a day or two. One morning I found it dead. I suppose it had not enough to eat. The mole has an insatiable appetite, and, according to the observations of some naturalists, it will devour birds. Mr. Bell says that "even the weaker of its own species under particular circumstances are not exempted from this promiscuous ferocity; for if two moles be placed together in a box without a very plentiful supply of food the weaker certainly falls a prey to the stronger. No thoroughbred bulldog keeps a firmer hold of the object of its attack than the mole. Mr. Jackson, a very

intelligent mole-catcher, says that, when a boy, his hand was so severely and firmly laid hold of by one that he was obliged to use his teeth in order to loosen its hold."

We now proceeded on our ramble, and I espied about one hundred yards off a heron on the bank of the Strine. He did not see us at first, but when we got a little nearer, off he flew, with his long legs stretched out behind, and his head bent close to his shoulders. He had evidently been fishing, for we could see the scales of fish on the side of the bank. Willy asked whether herons built on trees, and Jack wanted to know how they managed with their great long legs while sitting on their nests. These birds in the breeding season assemble together and make their nests on tall firs or oak trees; sometimes they build on rocks near the sea coast. It is said, too, that they will occasionally build on the ground. The heron's nest is not unlike that of the rook, only larger and broader; it is made of sticks and lined with wool and coarse grass; the female lays four or five eggs of a green colour, her long legs are tucked under her. Rooks and jackdaws sometimes take up their quarters near to a heronry, and do you know they steal their eggs, the rogues, and devour them. Both male and female herons take great care of their little ones and bring them food. Besides fish the heron will eat frogs, rats, young ducks, and coots. Eels are great dainties in the opinion of Mr. Heron; and sometimes an eel, after being pierced through the head by the sharp and strong bill of the heron, manages to wrap himself so tight round the bird's



neck as to stop his breathing and cause his death. A good many years ago herons were protected by the law; they were considered royal game, and their capture by the peregrine falcon was looked upon as very exciting sport. As we followed the bank of the stream out flew a couple of kingfishers with straight and rapid flight; we distinctly heard the shrill note these birds utter; they flew about two hundred yards and lighted on a rail near the water's edge. Let us see if we can get a little nearer to them, I said, and then sit down and see what they will do. "Papa," said May, "is not the kingfisher a very beautiful bird, and the most brightly coloured of all British birds?" Yes, it is; its splendid colours remind one of the gorgeous plumage of tropical birds, and we have no other British bird with such brilliant colours. There, did you see that? one of the birds darted off the rail into the water. I have no doubt he has caught a small fish; and now he has lighted on the same rail, and with my pocket telescope I can see him throw his head up and swallow some dainty morsel. It is not at all an uncommon sight to see a kingfisher hover over the water after the manner of a kestrel-hawk; suddenly it will descend with the greatest rapidity and again emerge, seldom failing to secure a fish for its dinner. "Did you ever find a kingfisher's nest, papa?" Willy inquired. Yes; some years ago I found one in a hole in a bank; there were four eggs in it, and I had to put my whole arm into the hole before I got at the nest, which consisted of sand mixed with a great quantity of very small fish bones. The eggs are very pretty, having a delicate pink tinge, the shell is thin, and the

form of the egg almost round. "But where," asked Jack, "do the little fish bones of the nest come from?" I think I have told you that many birds—hawks, eagles, owls, shrikes, &c.—throw up from their crops the indigestible portions of their food. It is not uncommon to find these on the ground in the course of one's rambles. Kingfishers possess this power; they throw up the undigested fishbones, and curiously enough, as it would appear, form them into a nest. There is a kingfisher's nest in the British Museum, which I remember to have seen a few years ago. It has been a disputed point whether the parent bird throws the fishbones up at random into the hole where she is going to lay, or whether she forms them into a nest. The nest in the British Museum was secured at the expense of great patience and pains by the celebrated ornithologist and splendid draughtsman, Mr. Gould, whose drawings you may one day see in the library of the museum at Eyton. This specimen, if I remember right, was of a flattened form and fully half an inch thick. It is said that the kingfisher always selects a hole that has an upward slope, so that, though heavy rains may cause the water of the river bank to rise into the hole, the eggs will be dry. Some naturalists have said that kingfishers do not make their own holes, but use those already made by other animals. Mr. Gould, however, is of opinion that kingfishers drill their own holes. The tunnels always slope upwards, as I said; at the further end of the tunnel is an oven-like chamber where the nest is made. The fish-bone nest is thought by Mr. Gould to be really a nest, and intended

to keep the eggs off the damp ground. However, there is difference of opinion on this point, and I reserve my own. We will see if we cannot find a king-fisher's nest some time this summer. Now, May, what little plant have you got hold of? "Indeed I don't know, papa, but it is a very curious little plant; I gathered it at the bottom of that hedge bank." Ah, I know it well, and a little favorite it is too; it is the moschatell. You see it is about five inches high, with pale green flowers and leaves; the flowers are arranged in heads of five each, namely, four on the side, and one on the top; it has a delicate musk-like odour, very pleasant and refreshing. Take a few specimens home and put them in water with your primroses. Mamma, I know, is very fond of the pretty little moschatell.

"Oh, papa," exclaimed Willy, "look at the bottom of this drain; what is that strange-looking insect crawling slowly about at the bottom?" I see; it is a water-scorpion, a very common insect in these drains on the moors,—indeed, it is common everywhere; let us catch him and take him home for examination. He is a queer-looking creature, with a small head and pointed beak; his fore-arms are something like lobster's claws; his prevailing colour blackish-brown, like the mud upon which he crawls; his body is very flat, and ends in two long stick-like projections; underneath these horny covers of the creature may be seen his two wings. He is an aquatic murderer; inserting that pointed beak into the body of some other insect, and holding his victim in his lobster-like forearms—oh! fatal embrace—he sucks out the juices of the struggling

prey. Kirby and Spence say that some of the tribe of insects to which the water-scorpion belongs are so savage that they seem to love destruction for its own sake. A water-scorpion which was put into a basin of water with several young tadpoles killed them all without attempting to eat one. The tail projections, I ought to tell you, are connected with the insect's breathing ; they are protruded out of the water and conduct the air to the spiracles at the end of the body, about which I must tell you more at another time. The eggs of the water-scorpion I have frequently found ; they are of an oval form, with seven long hair-like projections at one end. But it is time to go home, our walk to-day is over ; let us look forward to another holiday and another country ramble.



WALK II.

APRIL.

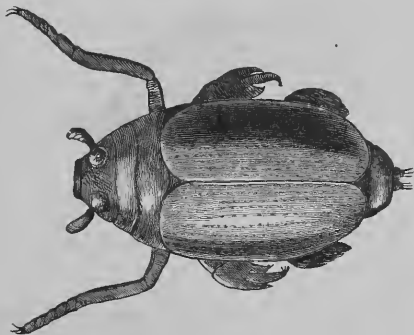


WE will walk to-day along the side of the canal bank as far as the aqueduct, then take the Duke's Drive and home by Lubstree Park; we shall find lots to see and to admire in the course of our ramble. We notice plenty of those beautiful balls of green jelly (*Ophrydium versatile*) in the clear water of the canal which, you know, we see every spring. These balls vary in size from that of a pea to that of Jack's fist; they are, you see, generally attached to some water-weed, and consist of myriads of very minute creatures called *infusoria*, which are imbedded in a mass of whitish jelly; these animals can detach themselves from the jelly and swim freely about; of course it requires a microscope to see the tiny green animalcules. If we examine a single specimen under a high power of the microscope we shall see its shape, which, when fully extended, is long and cylindrical, having at one end a mouth surrounded, as is usually the case in the *infusoria*, by a circle of very fine hairs, or *cilia*, as they are called, from the Latin word *cilium* an eyelash; the mouth opens into a long narrow channel, the creature's throat, which leads to its stomach; towards the opposite extremity the animal

tapers, till it ends in an extremely long fine hair-like tail which is fixed in the jelly-like ball; when the little creature prefers to swim freely about in the water it leaves its tail behind it, unlike, in this respect, to little Bo-peep's sheep! These balls were once supposed to belong to the vegetable kingdom, but there is no doubt about their animal nature.

"Oh! papa, what is that bird with a black head that flew from the side of the canal to the hedge?" said Willy "There, don't you see it?" Yes! I see, my boy, it is the black-headed Bunting or Reed Sparrow, common on the sides of rivers, canals, and ponds. The specimen you see on the hedge is a male bird, the females are a little smaller and have not black heads. See how beautifully contrasted are the deep-black head and white collar on the neck. In the spring and summer these birds may be frequently seen, male and female together; in winter they associate with others of the finch tribe, forming large flocks. The nest is generally placed on the ground amongst the sedges and coarse grass; the eggs, which are four or five in number, are laid in May and, I believe, a second brood sometimes is produced in July. The nests of the Reed-bunting are difficult to find, at least, I have seldom been successful. You know how cunning the peewit is in trying to lead people away from its nest or young ones. Well, some observers have remarked the same thing in the case of the reed-bunting. One writer says, "Walking last spring amongst some rushes growing near a river my attention was arrested by observing a black-headed bunting shuffling through the rushes and trailing along

the ground, as if one of her legs or wings was broken. I followed her to see the result, and she, having led me to some considerable distance, took wing, no doubt much rejoiced on return to find her stratagems had been successful in preserving her young brood." "Ha! ha!" interrupted Jack, "the gentleman was nicely deceived then." No, not entirely, because he goes on to say he afterwards found the nest, which had five young ones in it. One thing more I ought to tell you; not to confuse the reed-bunting with the reed-warbler, a very different bird, which very probably we may notice in to-day's ramble.



WHIRLIGIG BEETLE, MAGNIFIED.

We now had another look into the canal, and saw numerous little whirligig beetles, performing their merry-go-rounds on the top of the water. With what amazing rapidity they skim along, to be sure! Some diving beneath the surface, some resting on a water

leaf. If we catch one in our net and examine it more closely we shall see that, in form, it is like a miniature boat. It seems surprising that these little "whirligigs," "whirl-wigs," or "shiners," as they are called, should perform their rounds so closely together, without sometimes coming into collision. If you will look ever so long a time you will not see one animated boat run foul of another. Just think of a couple of hundred skaters on a small piece of ice playing at cros-stick. Oh! would they not be constantly knocking one another over? Now look at Mr. Whirligig's eyes,

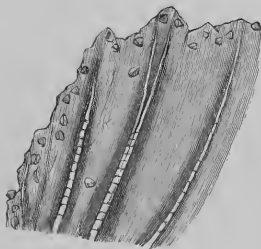


HEAD OF WHIRLIGIG BEETLE, MAGNIFIED.

a. Mouth. *b, c.* Eye.

you see each is separated into two parts by a division; the one is on the upper part of the head and looks towards the sky, the other is on the under part of the head and looks into the water. Now let us all keep quite still—the whirligigs rest. Now let us move—just look, they see our motions and off they start on their merry-go-rounds. It was with this upper part of the eye they saw us; should some sly fish, from below

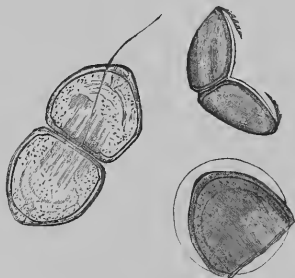
the surface of the water, make a rush at one, the beetle sees the enemy with his under eye and avoids him. What have you caught now, Jack? fish him out whatever it is. Oh! a fresh-water mussel, and a very fine specimen too; there are plenty of these fellows in the canal all the way from here to Newport. "Are they good to eat, papa?" asked Willy. I never tried one, but, from having often dissected specimens, I should say they were as tough as the sole of a boot. I never heard of anyone eating them. These molluscs carry their eggs, myriads in number, within their gills. The young, at the time they are ejected, are very curious little animals with triangular shells, and, oddly enough, they will fasten upon the fins or tails of fish, on which they will stick for some time, but how long I do not know. This particular mollusc is known by the



FRY OF SWAN-MUSSEL, PARASITIC ON A FISH'S FIN.

name of swan-mussel; the young fry are sent into the water in April and May. There is another kind of fresh-water mussel in rivers and streams, called the pearl-mussel, pearls being occasionally found

in them. I had one of these pearls once given me by a lad, taken from a river in the Isle of Man. I



FRY OF SWAN-MUSSEL, HIGHLY MAGNIFIED.

took it to a jeweller, in Liverpool, who valued it at a guinea. Your uncle Arthur, to whom I gave it, had it set in gold as a pin. "I wish," said May, who had



FRESH-WATER MUSSEL.

listened to this part of the story with great attention, "I wish pearl-mussels would live in the canal, it would be so nice to get the pearls out of them." Very few mussels are found to contain the pearls; perhaps you

might have to open many hundreds before you found a single pearl, and I should not like to cause the death of so many harmless animals for the sake of a single pearl.

“Here is another swan-mussel, and, just look, papa,” said Jack, “some other shells are fastened on it.” So there are; it is a lot of the curious and pretty little zebra-mussel. How prettily they are marked with zig-

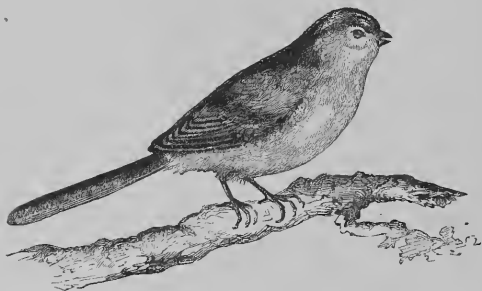


ZEBRA MUSCLE.—*b*. Byssus.

zag stripes of reddish brown, especially the young specimens. The name of mussel is better suited to these molluses than to the large kinds upon which the “zebras” are often attached, because, like the salt water mussel you have often seen at New Brighton, they have the power of spinning, what is called, “a byssus”—here, you see, is the substance I mean—by which they fasten themselves to shells, or to stones, roots, and other things.

There flies one of those pretty little birds, the long-tailed titmouse; it is common enough, certainly, but I never fail to notice several upon the hedges and poplar trees of the “Duke’s drive.” There are several members of the titmouse family found in Great

Britain; let me count them. First we have the great tit, then the little blue-tit, the long-tailed tit, the cole tit, the marsh, the crested and the bearded tit. How many does that make? Seven; but the crested tit is very uncommon, and the bearded tit does not occur in Shropshire. The other five are quite common and we shall, I dare say, be able to see all in the course of to-day's walk. The long-tailed tit, so called on account of the great length of the tail feathers, is a very



LONG-TAILED TIT.

active, lively little bird. Indeed, activity and liveliness belong to all the tit family. See how the little fellow flits from branch to branch, seldom remaining long on one spot. It is a very small bird, almost the smallest British bird we have; of course I am thinking of the tit's body and not taking into account its tail. The skin is remarkably tender, and thin as tissue paper. Like all the titmice, the long-tailed tit feeds on insects and

their larvæ. I do not remember to have heard or seen this species tapping the bark of a tree with its beak, as the great and the blue tit are frequently in the habit of doing, but most probably they do the same. "What do they tap for, papa?" asked May. I suppose for the purpose of frightening the tiny insects, which lurk under the bark, from their hiding places, when they quickly snap them up with their sharply-pointed bills and devour them. "Is not this the tit which the people about here call a bottle tit, and which makes a very beautiful nest?" asked Willy. Yes, the nest is indeed a very pretty object, and one that you would never, I think, confuse with the nest of any other bird. The outside is formed of that white-coloured lichen, so pretty and so common, and moss, and if you were to put your finger, May, into the inside, which is full of the softest feathers, you would say it was as nice as your own muff. The nest is oval, with a hole at the side. I believe that sometimes two holes exist, but I have never seen two in a nest. The eggs are very small, and are white with a few lilac spots. As many as a dozen or more are sometimes found in a nest.

The little blue-tit, which has just fled across our path is a very pretty active bird and common everywhere, in lanes, woods, and gardens. The blue-tit makes its nest in a wall or a hole in a tree and lays about nine or ten pretty little spotted eggs. How often I remember, when I was a boy, to have been bitten rather sharply by this little bird into whose nest I had placed my hand; I can fancy I hear the snake-like hissing which the blue-tit utters when some rude hand invades its

home. Its food consists of various kinds of insects and insect larvæ, which it finds on the bark of trees and in fruit buds. I think it does much good by destroying numbers of injurious insects, though gardeners and others destroy this bird, because they say it harms the fruit buds. Look at that little sprightly fellow, how restless he is ; in what curious attitudes he puts himself on yonder branch. Hark ! you hear him tapping quite distinctly. Besides insects, blue-tit does not object to make a meal of dead mice or rats. Mr. St. John tells us that a blue-tomtit once took up his abode in the drawing-room, having been first attracted there by the house flies which crawl on the window. "These he was most active in searching for and catching, inserting his little bill into every corner and crevice and detecting every fly which had escaped the brush of the housemaid." He soon became more bold and came down to pick up crumbs which the children placed for him on the table, looking up into Mr. St. John's face without the least apparent fear. Boys sometimes call the little blue-tit Billy Biter, no doubt from personal experience of the sharpness of Mr. Tit's beak. The great tit which we can see under the yew tree in our garden, almost any hour of the day, is very common in the neighbourhood, and I dare say if we look well about us during our walk we shall see some to-day.

"Oh ! papa," exclaimed Willy, "there are some birds on the towing-path of the canal, about sixty yards off; they seem to be breaking something with their beaks by knocking it against the ground ; just

look." Yes, they are thrushes, and I can tell you what they are doing and what we shall find when we come up to the spot. We shall see several broken snail shells (*Helix*), which the thrushes find on the grassy slopes of the canal bank, and then bring up to the path in order to get at the animals inside the shells by breaking them against the hard ground and stones. There! as I told you, you see at least a dozen broken snail shells. I am sure the thrushes do a great deal of good by destroying both snails and young slugs, and it is a pity their labours are not more appreciated than they are. Lads in the village, and great grown men from the collieries, are continually hunting for the nests, eggs, or young of thrushes, and many other useful birds, which they wantonly destroy. Now we get on the Duke's Drive, and there, on a branch of a poplar tree, I see the great tit. Look at him; he is the king of the titmice, and he seems to know it. He is a restless fellow, like tits in general. Look at his black head and breast, white cheeks and greenish back. Now, by one of his hooked claws, he hangs suspended from a branch; now again he is clinging by both legs; see how busy he is, examining the leaves and bark in search for insects. But Major Tit is a bit of a tyrant sometimes and uses that sharp short straight bill of his with deadly effect upon some of his feathered companions, on whose heads he beats repeated blows till he cracks the skulls and eats the brains! The marsh-tit and the cole-tit are pretty common in this neighbourhood, we may often notice them in our walks.

If Willy were to get over the hedge with his net and

dip it amongst the weeds of the pool, I dare say he will succeed in catching a few water-insects, which he can put in his bottle and bring to me. Of course the boy was delighted at the idea of dabbling with his net in the water—boys generally get immense fun from such amusement, and their clothes frequently not a little dirt. A weedy pond is a grand place for naturalists, and various are the beautiful and strange forms of animal life which are found there. Dipping amongst the duckweed and water-crowfoot is always attended with numerous captures, and Willy's bottle was soon full of active little creatures. Let us see what it contains. A large beetle is very conspicuous amongst the contents, now rushing to the top of the water, now sinking to the bottom, scattering far and wide the tiny water-fleas, and other little creatures by the strong and rapid movements of his swimming legs. This is the great water beetle; we will sit down on this clump of poplar tree by the side of the road, and take the beetle out and examine him; we must take care he does not bite our fingers as we hold him, for his jaws are powerful and sharp. Mr. *Dyticus*, for that is his learned name—from a Greek word which means “fond of diving”—is one of the most voracious of water-insects, but let us first examine his form. You see it is well adapted for the kind of life the beetle leads; look at that long oar-shaped pair of feet, what a broad fringe of hairs besets them, how admirably fitted they are for swimming; the wing-covers are smooth and glossy, without any furrows; by this I know the specimen to be a male, for the wing-covers of the female are fur-

rowed. The structure of the forefeet is very curious ; you observe its under portion forms a broad circular shield, covered with a number of sucking-cups, two or three being much larger than the rest ; by means of these sucking-cups the beetle can attach itself securely to any object it wishes. The wings are large and strong, and situated, as in all the beetle tribe, under the horny wing-covers. I will put this bit of stick near his mouth ; there, Jack, you see his strong jaws, and great use he can make of them I can tell you. If Willy were to put one of these beetles into his aquarium with his favourite sticklebacks, he would soon have cause to lament the untimely loss of some of them ; woe betide the unfortunate fish or newt that is once caught by the strong jaws of this fresh-water tyrant ! I have seen Mr. Dyticus rush upon a full-grown newt, and no twistings and writhings could free the victim from the fatal embrace. They will attack young gold and silver fish, and Mr. Frank Buckland has told us of the sad havoc these water-beetles do to young salmon, as witnessed by himself in a pond in Ireland. The forefeet you see are strong but small ; the beetle uses them as claws in seizing its prey and conveying it to the mouth. A young and tender fish, you can easily imagine, Mr. Dyticus would very readily devour, but he will attack beetles as large and even larger than himself, seizing them on the under side where the head joins the body, the only soft place in a beetle. Dr. Burmeister, a naturalist who paid great attention to insects, tells us that he once kept a beetle related to the great water-beetle, and saw it devour two frogs in the space of

forty hours. After the eggs are laid, which always takes place in the water, the larvæ are hatched in about a fortnight. In time—I do not know how long—these larvæ grow to the size of about two inches in length, and queer fellows they are, and very voracious and formidable-looking. Now, Willy, lend me your net, and I dare say we shall soon secure a specimen. What have we here? how the pond swarms with water-fleas! Oh! here is a treasure! What can it be? a long animated thread of glass—we will put it into a bottle by itself and I will tell you about it afterwards. Splash goes the net again, but no water-beetle larvæ. Never mind; what does the child's songbook say—

“ If at once you don't succeed,
Try, try, try again.

A capital little verse to remember, so we will try again; and there now we are rewarded by the capture of a dytiscus larva—a creature with a long body—in some respects reminding one of a shrimp. Oh! look at his jaws, how wide he opens them! You see that the last segment of the body is provided with a long pair of bristly tails, by means of which the creature can suspend itself at the top of the water. I have often kept specimens of these larvæ in vessels of water and noticed their predaceous habits; they feed on the larvæ of other water insects, but are not able to destroy fish, not being furnished with jaws or bodies nearly so strong as the perfect insect itself possesses. When the larva wishes to turn into its pupa state, it makes a round hole in the bank of the pond it inhabits, and there undergoes its change, turning into a full-grown beetle in about three

weeks' time. "Papa," said Willy, "I have often caught beetles that remind me of the great water-beetle, but



GREAT WATER-BEETLE, LARVA AND PUPA.

they are not so large; what are they?" They belong to the same family as the great water-beetles, and are called *Colymbetes*, *Acilius*, *Cybister*; I do not know that they have any English names. Come, we have dabbled in this pond long enough for the present, let us proceed on our walk. "Well, but, papa," said May, "you have not told us what that long worm-like creature is in the separate bottle; do let us look at it again. Oh! really it is a curious creature, why it is as transparent as glass, now it jerks itself about, now it floats without motion in mid-water. What is it?" "I am inclined to think,"

said Willy, "judging from its wriggling, jerking motions that it must be the larva of some kind of gnat." Right again, my boy, it *is* the larva of a gnat, and one known to naturalists by the name of *Corethra*; you see there are eleven divisions or segments in the body; the head is of strange form, and near the mouth are two hooked arms which spring from the middle of the forehead and bend down in front of the mouth; with these weapons the *Corethra* larva seizes its prey and crushes it between two rows of sharp spikes placed under the mouth; after being bruised and mangled by this apparatus the prey



CORETHRA LARVA, MAGNIFIED.

is ready to be swallowed. "But what," asked Jack, "are those four curious black bodies; one pair near the head, the other pair near the tail of the animal?" They are air-sacs, and are connected with the breathing or respiration of the larvæ. Some have supposed that they serve the same office as the swimming bladder of certain fish, which being compressed or dilated at will enables the creature to remain still in mid-water or to rise or sink in it. After a time the larva changes to a pupa, in which state it lives without eating for a few days, and then turns into a gnat. We now proceed on our walk and come to a part of the road which has a plantation on either side; we see a little active

creature crossing the road and at once recognise a weasel. Let us keep quite still and silent, and we shall, I dare say, have an opportunity of watching it for a short time. Just look at him! how nimbly the little creature runs along; now he stops and raises his head as if listening for something, now off he starts again; he is evidently hunting, and probably is on the scent of a young rabbit, rat, or field-mouse. Ah! see he has caught something on the grass near the hedge; what has he got in his mouth? it is a small rat, I think; now he throws his flexible body over it and gives it one or two bites. Now, Jack, run up and catch him. Ah! he is off like a shot; you must not think to "catch a weasel asleep." I often see these little animals in my rambles, and always stop to witness their extraordinary activity. Weasels will sometimes climb trees and surprise some unfortunate bird on her nest; they are fond of eggs, and a bird's young brood are very dainty morsels; they will also eat moles and are sometimes caught in mole-traps. An excellent observer mentions a case of a mole-trap having been found many years ago with two weasels in it; they had been hunting in the mole's runs, had come in opposite directions, and "by a curious coincidence, must have both sprung the trap at the same instant." Weasels are generally classed as vermin and killed on all possible occasions; I think it is often a mistake to destroy them; no doubt they will occasionally catch a young rabbit or a leveret or suck a few partridges' eggs, but the common food of the weasel consists of such small animals as mice, moles, rats, small birds. In wheat or other grain ricks,

they ought to be encouraged, as they enter them for the sake of the rats and mice they find there. I have been told by a friend that in some parts of Wales the farmers look upon the weasel as a friend, in consideration of the destruction it causes to mice and rats. A gentleman living near Corwen killed a weasel, and expected to receive the thanks of the farmer on whose land it had been killed ; he was surprised to find that the farmer was by no means grateful. In this respect I think the Welsh farmers are wiser than the English ones. Hawks sometimes prey upon weasels. Mr. Bell tells a story of a gentleman who was riding over his grounds, once



STOAT AND EGGS.

having seen a kite pounce upon some object on the ground and rise with it in his talons. "In a few moments the kite began to show signs of great uneasiness, rising rapidly in the air, or as quickly falling, and wheeling irregularly round, whilst it was evidently trying to force some hurtful thing from it with its feet." After a short but sharp contest the kite fell suddenly to the ground, not far from where the gentleman was watching the proceeding. On riding up to the spot "pop goes the weasel," none the worse for his aerial

journey, but the kite was dead, for the weasel had eaten a hole under the wing. The weasel makes its nest in a bank or in loosely-constructed stone walls; three or four young ones are generally produced. Some years ago I remember seeing a mother-weasel and three young playing about on a bank. It was a most interesting sight. The weasel is much smaller than the stoat, and you can tell it at once by its tail, which is entirely red; that of the stoat has a black tip. But it is getting late and we must hasten home.



WALK III.

MAY.



TO-DAY we will go and hunt for sticklebacks' nests; as it is calm I think we shall have very little trouble in finding a few; a calm day should always be chosen, because to find the nests of these little fish it is necessary to have very sharp eyes, and to look very closely, and you know if there is much wind the water is ruffled, and then it is not easy to see objects in it. Let us start off, then, with bait-can, canvass-net, and two or three large-mouthed bottles, to that small, clear, shallow pond in Mr. Jervis's field, and see if we can bring home a few fish and eggs. "It will be great fun," said Willy, "and when we have caught the little fish we will bring them home and put them in my aquarium." There are three species of sticklebacks found in this country, the three-spined, the ten-spined, and the fifteen-spined—this last inhabits salt water. All three build nests, and show great care for their little brood. The nests of the three-spined species are those most generally known, though I dare say, if we search carefully in the drains on the moors, we shall be successful in finding a nest of the ten-spined fellow, or tinker, as he is sometimes called. Here we are at the pond, how clear



THREESPINED STICKLEBACK AND VEST.

it is, and how beautifully green are the few patches of star-wort in the water! As the grass is quite dry we can all sit down so as to get our eyes as near to the water as possible; never mind a few crawling ants. May; if they bite you, I shall not feel it. Ah! do you see that little fellow with crimson breast and eyes like emeralds? He sees us, for look how disturbed he seems; now he darts away and hides under a weed, but soon returns to the same spot; it is pretty certain he has a nest close by. I will put my walking-stick into the water near him. Well, actually, the brave little fellow is not the least frightened; see, he bunts his nose against the stick, and is very angry; he is afraid of some danger to his nest—this makes him so bold. Now I have made out where the nest is, it is close under him; do you see a few small holes in the mud at the bottom of the water? No, you don't see anything; well, then, give me my stick and I will point them out. There now, do you see what I mean? Yes, you do; that is all right. "Let us get the nest out of the water," said Jack. Have patience; let us watch what the fish is doing; see, he is busy fanning away with his tiny fins directly over the nest. "What is he doing that for?" said Willy. The quick movements of his fins bring fresh currents of water to the eggs or little fry that may be within. Ah! did you see that? another fish came near the nest; how furiously our brave "soldier" charged him; how quickly the intruder retired! I do not think he will dare to approach so near again for a long time, for those sharp spines on the under side of the soldier are

like a couple of bayonets and can inflict serious wounds. Let us leave this nest for a time and try to find some more. Now that you have once seen a nest, you will not have much difficulty in finding others. Willy soon found another nest; "just look," he said, "there are a lot of the tiniest little things close to the nest." Yes, indeed, so there are; the eggs have hatched, and these are the little fry; there is Father Stickles quite proud of his numerous family, and quite ready to fight for them should any enemy be rash enough to intrude, for you must know that sticklebacks, like many other fish, do not object to eat the young fry of their neighbours, and if the parent there—it is the male only that is the protector—were to be removed, a hungry pack of other sticklebacks would crowd around and make sad havoc amongst that happy little family. I remember some years ago having once taken a father stickleback away from his nest, and, after putting him in my collecting bottle, I sat down to watch the result. Soon an invading army of other sticklebacks approached and attacked the nest for the purpose of getting at the clusters of eggs it contained. They pulled it about sadly, till I began to be sorry for what I had done. I returned the captive-parent to the water; at first he hardly knew where he was, and seemed confused, the result, no doubt, of his confinement in the bottle; but he was not long in coming to himself—he remembered his nest and the treasures it contained; he saw that devastating army all around it, and, summoning all his courage, the soldier-parent began an attack, now rushing at one and now at another enemy, till he was left

alone on the battle-field, having thus gained, single-handed, a glorious victory indeed.

Well, we will take this one home, with nest and eggs it contains. You see the nest is a mass of tangled grass roots and other weeds ; now that it is out of the water it is a shapeless mass. However, here is a cluster of pinkish eggs, and if you look closely you will see two little specks in each egg ; so that the fish is being formed, for these are the little thing's eyes. You can see, too, the tiny things jerking their tails about every now and then. It is most interesting to watch the care the parent takes of his little ones when hatched. Some few years ago I put a male stickleback in a basin of water in charge of his nest. When the young ones were hatched it was most curious to notice his anxiety for their welfare. Of course young sticklebacks, like young children, are of an inquisitive turn of mind, and apt to play truant too occasionally ; but should some little fellow wander too far from the nest, Father Stickles hurries after him, takes the little truant in his mouth, and spits him out right over the nest. This I repeatedly witnessed myself, and I have no doubt you will be able to see the same thing yourselves.

“Are not sticklebacks quarrelsome little fish?” asked Willy. Yes, they are very fond of fighting, and they are so bold that they do not fear any enemy, whatever his size. I once kept a small pike, about ten inches long, in an aquarium, into which I also introduced five or six sticklebacks. I suppose the pike did not much like the look of the prickles or spines, for he did not eat the fish. Once I saw him make the attempt,

but after getting Master Stickles into his mouth, he quickly threw him out again, not relishing, I suppose, the *sauce piquante* of the spines. The sticklebacks were really masters; they tormented Mr. Pike dreadfully; first one would take a bite at his tail, and then another, till the tail had a woful expression indeed; so I turned the pike into a pool of water, and I dare say the *retail* business has long ere this been completed.

“Arc there any other kinds of fish,” asked Willy, “that make nests and take care of their young ones like the three species of sticklebacks?” Yes, there are several kinds of fish which do so, but no other British fresh-water kinds, I believe. There is the salt-water *Lumpsucker*, a fish of strange form and brilliant colour—you know the pickled specimen in my study—whose young soon after birth fix themselves to the sides and on the back of their male parent, who sails, thus loaded, away to deeper and more safe retreats. There are the long pipe-fishes, the males of which possess each a singular pouch on the tail; in this the eggs of the female are deposited and matured; the young ones occasionally leave their strange abode, and after swimming about for a time return to it again, reminding us in this respect of the kangaroos and opossums amongst mammalia. There are also fish which inhabit the rivers of Demerara which make nests and show great attachment to their young ones, and I dare say several other fish will be found to do the same.

“Oh! papa, do look here; as I was turning over this bit of flat tile I saw in the water I found a creature something like a leech, and on raising it up I saw what

looks like a quantity of the animal's eggs, and she seems to be sitting upon them as a hen upon her eggs." All right, Jack ; let me look, I dare say it is one of the snail-leeches. Yes, to be sure it is, and here are the eggs which the creature carefully covers with her body, and upon which she will sit till the young ones are formed ; the small brood, sometimes one hundred and fifty or more in number, then attach themselves to the under surface of the parent, and are carried about



SNAIL LEECH.

wherever she goes. There are various species of this interesting family ; all are inhabitants of fresh water ; some incubate or sit upon their eggs, others carry them about in a hollow formed by the contraction of the sides. They have a long tubular proboscis, by means of which they suck out the juices of pond-snails and other water creatures. These snail-leeches move along in the same way as the common horse-leech and the medicinal leech, namely, by fixing the head-part on to the surface of some substance in the water and then drawing the hinder part up to it ; they then extend the head-portion and fix it upon another spot, again drawing up the other extremity. But the leeches, properly

so called, have all red blood; that of the snail-leeches is colourless.

“Is the leech used to bleed people when they are ill ever found in the ponds of this country?” asked Willy. I believe it is rarely met with now-a-days; most of the leeches used in medicine are imported from Spain, Hungary, the south of France, and Algeria; many millions are brought every year to this country. The medicinal leech was, however, once pretty common in the lakes and pools of the north of England. The poet Wordsworth introduces us to an old leech-gatherer lamenting the scarcity of the animals in the following lines:

“He with a smile did then his words repeat
And said that gathering leeches far and wide
He travelled; stirring thus about his feet
The waters of the pool where they abide.
Once I could meet with them on every side;
But they have dwindled long by slow decay;
Yet still I persevere and find them where I may.”

This sonnet was written in 1807, and when we consider the immense numbers used in medicine, and the utter neglect of leech culture in this country, we shall cease to wonder that native leeches are very scarce. It is said that four only of the principal dealers in London import every year more than seven million leeches. The annual demand in France was estimated in 1846 to be from twenty to thirty millions; Paris requiring three millions a year. “I should be very sorry, papa,” said Jack, “to walk about like the old man in the lines you quoted just now, with bare legs in the water, making them a bait for leeches. Ugh!

it is horrible to think of; they must suck a good deal of blood from the man's legs." There is nothing like being used to a thing, and when you remember that many people derive their whole support from the leeches they gather, you will not wonder that they do not fear a few leech bites. I do not suppose they lose much blood; no doubt the gatherers pick them up pretty quickly and put them into their collecting cases; besides the chief flow of blood from a leech-bite occurs after the leech has been removed; the flow is encouraged by the application of warm fomentations, but the cold water of a pool would stop the flow of blood in the case of the man's legs. We ought to be thankful for the existence of an animal which is of such immense service to mankind. I suppose it was the appreciation of their value in medicine that induced French ladies, about forty-five years ago, to regard leeches with especial favour. Many people remember the Cochin-China *mania* and the sea-anemone *mania*, but, May, what will young ladies say to the fact that in 1824 there existed in France a *mania* for leeches? The most enthusiastic admirer of Cochin fowls or sea-anemones would never have thought of carrying her admiration of her pets so high as to wear on her dress figures of these animals; but we learn from a French writer that there might have been seen at that period elegant ladies wearing dresses *à la Broussais* on the trimming of which were imitations of leeches! Broussais, you must know, was a physician, no doubt a fashionable ladies' doctor, and a great patron of leeches. "What," asked Willy, "are the leeches I often find in

the drains on the moors and in other places?" I have no doubt you often find these kinds; there is a small leech, the commonest of all, called *Nephelis*, whose little oval cocoons are so frequent on the under sides of stones in the water and on water plants. I will soon find a few cocoons; look here, under this bit of brick tile are five or six; they now contain eggs, as I will show you, by slitting open the case with my penknife. These gradually change to young leeches, which find their way out of the cocoon through one or other of the two openings at either end. Then there is the horse leech, and another very similar to it, called *Aulastoma*, which means having "a mouth as wide as a hall;" it has no English name, but we may give it one if you like, and call it "the hall-mouthed leech." Its mouth is capable of great stretching, and can readily take in huge earthworms nearly the size of itself. I once witnessed a curious sight—I put a couple of "hall-mouths" into a glass vessel of water, and introduced also a great fat lob-worm; each leech seized the worm, the one took the head, the other the tail. As the worm got gradually swallowed the two leeches came to very close quarters, and at last touched. What was to happen? would they twist and writhe about and break the worm, and so share the "grub" between them? No; the one fellow quickly proceeded to swallow his antagonist. I watched him carefully, and he succeeded in getting down the red lane about an inch of his companion; but whether he did not like the taste, or whether he had qualms of conscience for taking such unfair advantage of a near relation, I

know not; after a few minutes the partly swallowed leech made his appearance again, apparently none the worse for his temporary sojourn in the throat of his companion. This leech may be seen sometimes on damp earth in search of its favorite earthworms. I should mention also that another worm-devouring leech has lately been found in this country; it is known by the name of *Trocheta*, called after a French naturalist, Du Trochet, who first described it. I dare say if we look carefully we shall find it in this neighbourhood. All these leeches lay cocoons in which the young are developed. Let us leave the pool and take our little fish with us, taking care not to shake the can more than we can help. We are now in the fields; the grass is beautifully green after the late rain. Look at that crab tree in the hedge; did you ever see such a magnificent mass of blossom? The hawthorn hedges are loaded with May-buds; what a show of May there will be in a fortnight's time. Let us gather a sprig of crab blossom and a few bits of May-bud, and see if we cannot gather a pretty handful of wild flowers for May to take home to mamma. Here are a few cowslips with their drooping golden bells and delicious scent; I am afraid we shall not find enough to make a cowslip ball. Here is cuckoo-flower, which, as old Gerarde says, "doth flower in April and Maie, when the cuckoo doth begin her pleasant notes without stammering." Old Gerarde, by the way, ought to have said "*his* pleasant notes," for it is the male bird alone that cries "cuckoo." Its flowers are of a delicate pale purple when at the height of its beauty; they become nearly white when

on the wane. "Ladies' smock" is another name for this harbinger of Spring ; Shakespeare speaks of it—

"The daisies pied and violets blue,
And lady-smocks all silver white."

Here is blue speedwell and the delicately pencilled stitchwort with its pure snow-white blossoms and delicate green leaves. It is a lovely Spring flower and very common amongst the grass of every hedgerow. We will pluck a few bits ; how brittle the stem is. What curious ideas our ancestors must have had ; fancy calling this plant "all-bones !" Its name, stitchwort, no doubt alludes to the plant's supposed virtue in cases of "stitches" in the side. The following lines of Calder Campbell on Spring flowers I am sure you will think very pretty :

"The buds are green on the Linden tree,
And flowers are bursting on the lea ;
There is the daisy, so prim and white,
With its golden eye and its fringes bright ;
And here is the golden buttercup,
Like a miser's chest with the gold heap'd up ;
And the stitchwort with its pearly star,
Seen on the hedgebank from afar ;
And there is the primrose, sweet, though wan,
And the cowslip dear to the ortolan,
That sucks its morning draught of dew
From the drooping curls of the harebell blue."

Here is more "May-flower" or marsh marigold ; let us take some ; it will make a bright show in our wild-flower cluster. We will put a sprig or two of copper beech, with its rich brown leaves, which we can get from the garden, two bits of lilac, purple and white ;

and though the nosegay is common, it is still very beautiful, and mamma will put it in her best vase and give it a place in the drawing-room for those to admire who have hearts to admire the wild gifts of Nature.

Why, Jacko, what are you grubbing up in that ditch? "I am not grubbing up anything," said Jacko, "but here are a lot of black creatures, lively enough when you stir them up; I suppose they must be tadpoles." Tadpoles, Jack, unquestionably, but are they the young of the toad or the frog? Let me see. Well, it is not easy to say which in their present stage, a tadpole is so like a tadpole, whether the young of frog or toad. If you had found the eggs, which you might have done earlier in the year, there would have been no difficulty in saying whether they belonged to a toad or a frog; for the toad lays its black eggs imbedded in a long clear jelly-like line, whereas the frog's eggs are imbedded in a shapeless mass of jelly. Look at some of these little black fellows, as black as niggers; there is a delicate fringe on each side of the head; these are the creature's gills and answer the same purpose as the gills in a fish; the blood circulates through them, and is made fresh and pure by the action of the air contained in the water. In this state the tadpole is more of a fish than a reptile; in a short time, however, these gills will be lost and then the tadpole can no longer breathe the air of the water, but must come to the surface to take in air from the atmosphere. By-and-by we should see two small tubercles appear near the root of the tail; these are the first indications of hind-legs. Meanwhile the fore-legs are budding forth, and in time would assume their

distinct forms. The changes of the tadpole, when it is a fish, to a frog, when it becomes a reptile, are most curious and instructive. If you have never seen the circulation of blood in a tadpole's tail, you have something to look forward to, and I will promise to show it you some day under the microscope. "What kind of frog," Willy asked, "do they eat in France? because you know the French eat frogs." The frog which the French eat is a different species from our common frog, though I dare say our common frog would be quite as good. The edible frog has been several times found in this country, and Mr. Eyton says that during the time a detachment of the French were prisoners at Wellington, they were highly delighted to find their old friend the edible frog in the wild moors here. I have never myself seen any other than the common frog in this neighbourhood. You may think a frog would make a curious sort of pet, but a gentleman once kept a frog for several years quite domesticated. It made its appearance in an underground kitchen at Kingston on the banks of the Thames. The servants, wonderful to say, showed him kindness and gave him food; one would rather have expected that they would have uttered loud shrieks of terror and fainted away at the unexpected sight. Curiously enough, during the winter seasons, when frogs as a rule are lying asleep at the bottom of a pool, this frog used to come out of his hole and seek a snug place near the kitchen fire, where he would continue to bask and enjoy himself till the servants retired to rest. And more curious still, this frog got remarkably fond of a favourite old cat, and used to nestle under


the warm fur of Mrs. Pussy, she in the mean time showing she did not in the least object to Mr. Frog's presence.

Both frogs and toads do a great deal of good by destroying quantities of slugs and injurious insects; they are, moreover, perfectly harmless. Some ignorant people, who love to destroy everything, insist on killing frogs and toads; they say they eat the strawberries in their gardens. Did you ever examine a frog's or a toad's tongue, Willy? You never did; then I hope the next frog you catch you will carefully open his mouth—treat him as if you loved him, as honest Isaac Walton says—and give me some short account of the structure of a frog's tongue. “All right, papa,” said Willy, “I will bear the matter in mind. It makes me laugh, though, to think of my examining a frog's tongue; still I wonder what it is like, and I wish I could at once catch a frog to see; but we are now again near home, and I must wait for another walk.”



WALK IV.

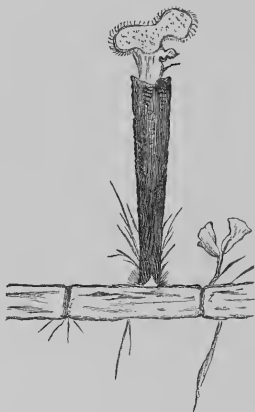
MAY.

“APA,” said Willy, “you once told me of a very beautiful little creature, almost too small to be seen by the naked eye, that lives in water, and builds its house out of the small particles of clay or mud that float therein. The bricks are not of the shape of house bricks, but quite round. Do you not think we can find some of these animals in the course of to-day’s walk? I forget the name of the creature.” I know what you mean; you are speaking of a microscopic animal called *Melicerta*. “Oh, yes, that is its name, now I remember.” I have no doubt we shall be able to obtain specimens from the canal; so we will walk along the bank for a short distance and then get into the fields again. We must take with us a clear wide-mouthed bottle, and we shall soon see whether we have captured any specimens. These exquisite little creatures attach themselves to the leaves and stems of water-plants; they are most readily seen on the finely cut leaves of the water-buttercup or spiked milfoil. The way to proceed is to place a tuft of this plant in the bottle and to hold it up to the light, and we shall soon see whether any *Melicertæ* are there. Here is plenty of water-



buttercup—a very interesting plant by-the-bye, and one which is subject to much variation; for when it grows in swiftly flowing water all the leaves are very long and hair-like, but in still water there are flattened leaves as well, and the hair-like leaves are not nearly so long. You see it is now in flower; a beautiful white mass it forms in small still ponds. “Well, but, papa,” said May, “the flowers are white, and I thought all buttercups were yellow.” Nearly all the buttercups have yellow flowers, but there are two British species which have white blossoms, namely, this one and the little ivy-leaved buttercup, or crowfoot, as it is often called, which is found either in the water or near the water’s edge. Though the ivy-leaved crowfoot is generally regarded as a species, I think it is only a variety of the one we are now looking at. Now I fish a plant out with my stick and nip off a tuft of hair-like leaves and pop it into the bottle. Have I anything here? No doubt the microscope would show countless numbers of minute animalcules, but I detect no *Meliceræ*. Let us try again. I nip off another tuft. There! do you see one, two, three, four little things sticking almost at right angles to some of the leaves? No, you see nothing? Well, perhaps not, for your eyes are not so accustomed to these things as mine are, but I will take out my pocket lens; there, surely you see that one close to the side of the bottle, do you not? Oh yes, you see what I mean; well, that is the case or house of a *Melicerta*, which animal I will describe to you, and when we get home we will look at it under the microscope. The case is about the twelfth part of an inch

long and about the thickness of a horsehair, and of a reddish colour generally, though the colour depends on the nature of the material out of which the case is made. Let us sit down and put the bottle on this large stone, and I dare say some of the creatures will soon show their heads at the top of the tubes, for they are all indoors now; the disturbance caused in breaking off the bit of weed and putting it in the bottle has alarmed the *Melicertæ*, and very quickly they sunk within their houses of clay. Now I see one fellow slowly appearing



MELICERTA, ON WEED, MAGNIFIED.

at the top, after the manner of a chimney-sweeper, but certainly in a much more elegant form. There! it has unfolded four flower-like expansions, of which the uppermost are much the largest. The animal shows only

the upper part of its body, and I can see with my pocket lens that it is somewhat transparent and whitish. But my lens has not sufficient magnifying power to reveal more, so I must tell you what I have seen of *Melicerta* under my compound microscope. Each of these four leaf-like lobes or expansions is surrounded with very minute hairs, which can move with great rapidity in all directions; these you will remember are called "cilia," from the resemblance to *eyelashes*, for which cilia is the Latin word. The motion caused by these numerous cilia lashing the water brings currents containing particles of food for the *Melicerta*, and materials for his house. Mr. *Melicerta* "is at once brick-maker, mason, and architect, and fabricates as pretty a tower as it is easy to conceive." The mouth is situated between the two large leaflets, and leads to a narrow throat, in which are the curious jaws and teeth of the animal. Below the jaws are the stomach and intestine; so you see the *Melicerta*, though so minute a creature, has a complex structure. "You said, papa," remarked May, "that the little creature makes its own tube; how does it do that?" Upon the upper part of the head there is a small hollow cup, which is lined with cilia, and probably also secretes some sticky fluid to make the pellets of clay adhere together; the particles of clay and mud, having been brought to the space between the leaflets by the action of the cilia, are conveyed to this little cup-shaped cavity, and are then worked about by the cilia within, till a round pellet is formed which completely fits the cavity. The little creature then bends itself down upon

the tube and deposits the pellet upon it, then it raises itself up again and proceeds to form another brick, its jaws working all the time. "I wonder," said Jack, "how the little creature manages to set apart and put in its proper place the particles required for food and those required for brick-making; it would be funny if it sometimes made a mistake and put the clay in its stomach and the food in the brick machine!" It is curious, indeed, to know how the materials are put in the proper place; I suppose the *Melicerta* has the power to change the direction of the currents and thus to place the particles in their proper place. By rubbing a little paint, such as carmine or indigo, in some water and placing a drop upon the glass slide with the *Melicerta*, these currents may be readily seen; and I have more than once seen rows of coloured bricks, red or blue, which the animal moulded and then deposited on the tube! We will take the bottle home, and if you have patience I doubt not I shall be able to show you a good deal of what I have been describing; but you must have patience, for, as an excellent naturalist has said, "The *Melicerta* is an awkward object to undertake to show to our friends, for, as they knock at the door, she is apt to turn sulky, and when once in this mood it is impossible to say when her fair form will reappear. At times the head is wagged about in all directions with considerable vehemence, playing singular antics, and distorting her lobes so as to exhibit a Punch and Judy profile."*

Hark! what is that bird singing so sweetly and with

* 'Marvels of Pond Life,' by H. J. Slack, p. 92.

such animation in the hedge? Do you hear? It is the dear little sedge-warbler; often, indeed, heard, but not so often seen, for it is fond of hiding itself in bushes or sedges. The sedge-warbler, like the migratory warblers generally, comes to us in April and leaves us in September. How often have I listened with delight to its music when returning home quite late at night in summer months! If the bird stops its music for a few moments, you have only to throw a stone among the bushes and the singing commences again. I am not clever in describing musical sounds, and I cannot



NEST OF REED WARBLER.

describe that of the sedge-warbler, nor can I always distinguish it from the song of its near relative the reed-warbler. Both imitate the songs of other birds, and their incessant warblings and babblings at night cause them to be often mistaken for nightingales. I have generally found the nest of the sedge-warbler on the ground, on a tuft of coarse grass or sedge; the nest of the reed-warbler is supported on four or five tall reeds, and is made of the seed-branches of the reeds and long grass wound round and round; it is made deep, so that the little eggs are not tossed out when the reeds are shaken by the high winds.

Hark! there is the cuckoo; how clearly he utters "cuckoo! cuckoo!" He is not far away. Some people can imitate the well-known note so well as to deceive the bird and bring it near the place where they are hiding. Your Uncle Philip only the other day made a cuckoo respond to him; had the day been calm instead of windy, he would, no doubt, have induced the bird to come close to us. There he goes with his long tail, flying something like a hawk. You should remember the rhyming lines about the cuckoo's visit to this country:

In April,
Come he will.
In May,
He sings all day.
In June,
He alters his tune.
In July,
He prepares to fly.
Come August,
Go he must.

"I think you said, papa," said May, "that it is only the male bird that utters the cuckoo note; what kind of a voice has the female?" I have never heard the note of the female cuckoo. Mr. Jenyns says, "The note of the female cuckoo is so unlike that of the male, which is familiar to every one, that persons are sometimes with difficulty persuaded that it proceeds from that bird. It is a kind of chattering cry, consisting of a few notes uttered fast in succession, but remarkably clear and liquid." Very curious are the habits of the cuckoo. Unlike most other birds, they do not pair; you all know, too, that cuckoos make no nests, but lay their eggs one by one in the nests of various other birds, such as those of the hedge-warbler, or hedge-sparrow as it is generally but wrongly called, robin, white-throat, and other birds. It is probable that the same cuckoo does not go twice to the same nest to deposit her egg. What a curious exception is the case of the cuckoo to the instinctive love of their offspring observable in almost all birds! After the eggs are laid the parent bird has no further trouble with them; no period of incubation to bare the breast of the brooding bird; no anxiety about her young ones, as some idle, wanton lad hunts amongst the trees and bushes, destroys both nest and eggs, or tortures the helpless fledglings! "But, papa," said Willy, "how does it happen that the young birds hatched in the same nest with the young cuckoo always get turned out of it." The cuckoo, being much the larger and heavier bird, fills up the greater part of the nest, consequently the smaller fledgling companions get placed on the sides of the nest,

and partially also on the back of the young cuckoo; when, therefore, the latter stands up in the nest he often lifts up on his back one of the small companions, who thus gets thrown headlong to the ground. This seems to me to be the mode in which the ejection sometimes takes place, till at last the young cuckoo is left sole possessor of the nest, and of course gets all the food; at the same time I ought to say that some



CUCKOO.

naturalists attribute a murderous disposition to the young cuckoo, and say that the other inmates of the nest are maliciously thrown out. Others, again, say

that the foster birds throw their own young ones out. It is certain that the young are sometimes treated thus, for they have been seen on the ground when the young cuckoo was too small to eject them itself. "But why do not cuckoos make nests and sit on their eggs like other birds?" said Jack. Such a question is more easily asked than answered; nevertheless I hope you will always try to discover reasons for things. "It is now," writes a celebrated naturalist, "commonly admitted that the more immediate and final cause of the cuckoo's instinct is, that she lays her eggs, not daily, but at intervals of two or three days; so that if she were to make her own nest and sit on her own eggs, those first laid would have to be left for some time unincubated, or there would be eggs and young birds of different ages in the same nest. If this were the case the process of laying and hatching might be inconveniently long, more especially as she has to migrate at a very early period, and the first hatched young would probably have to be fed by the male alone." The cuckoos come to this country about the middle of April; the male birds arrive before the females. Whether this arrangement is ungallant conduct on the part of the gentlemen birds, who prefer to come alone, or whether, just when the gentleman cuckoo is ready and almost impatient for a start, her ladyship has all at once discovered some important matter that ought to be finished before leaving the country, some adjustment of her dress, some tiresome feather that will ruffle itself up in spite of every effort to keep it smooth, I know not, but the fact remains, that my Lord and Lady

Cuekoo do not travel together. Let us suppose that both sexes have arrived in this country, we will say about the 23rd of April. It is natural they want a little time to look about them; at any rate, no egg is ready for being sat upon till some weeks after the arrival of the birds, say the 15th of May. The eggs require fourteen days' setting before they are hatched; this brings the date to the 29th of May. The young ones will require three weeks in the nest and constant feeding all the time; we now arrive at about the 20th of June, when the young ones would be ready to leave the nest. But they want five weeks' more feeding by the parents, after they leave the nest, before they are able to provide for themselves; this would bring the date to about the 25th of July, when there is hardly a parent bird in the country; they have left for other parts of the world. "Oh! but, papa," said Willy, "you said in the lines you told us to remember—

In July,
He prepares to fly.
Come August,
Go he must.

And now you say the cuekoos leave before the end of July. I think you must have made a mistake somehow." I am glad that you have found out the error, if it is one. Old rhymes are not always to be trusted; but I suspect that the couplet "Come August, go he must," means to imply that the cuckoo does never really stay so late with us. I must not, however, forget to tell you that it is the old parent birds that leave us early; young birds remain till Sep-

tember, and even October, but they have not by that time acquired the cuckoo note. If you ask why cannot the old cuckoos stay with us a little longer, and then all go away together as a family party, young and old, in September, instead of being in such a hurry, I have only to say that it is the fashion amongst cuckoos, and of course cuckoos, like certain other animals, must be in the fashion. This is Dr. Jenner's explanation of the peculiar habits of the cuckoo in respect of its eggs. I am not prepared to say whether or not it is sufficient to explain them. The cuckoo's egg is very small when compared with the size of the bird; it is of a pale grey tinged with red.

"But how does the cuckoo's egg get into some of the nests?" asked Willy; "for some of the nests in which the cuckoo's egg is found are too small to allow the cuckoo herself to enter to lay her egg." You are quite right; I believe it has been proved that the cuckoo lays her egg on the ground, and carries it in her bill into other birds' nests.

"Oh! papa," said Jack," what is this curious plant that grows so abundantly on the grass here? I know it well by sight, but do not know its name." It is a spike of horse-tail; see how the stem is marked with lines, and how curiously jointed it is, and quite hollow except where the joints occur. The fruit is borne at the top of the plant (*a*); see, as I shake it, what a quantity of dust comes from it; this dust is the fruit, or spores as they are called; each spore is of an oval form, with four elastic threads. If I were to put some of this

dust on a glass slide, and look at it under the microscope, I should see a curious sight. The four threads would be spread out, but if I were to breathe on the glass, these threads would coil themselves round the oval



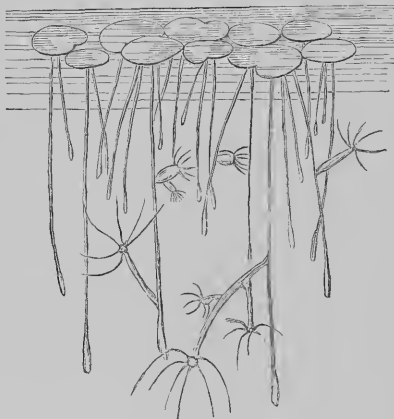
HORSE-TAIL.

body; but as soon as the effect of the moisture had passed away, the threads would shoot out again in the same position as they were at first, causing the spore

to leap as if it were alive. The stems are of two kinds, fertile and unfertile; the one you have in your hands is a fertile spike, and appears only in the spring; the unfertile ones have no dust-like fruit, and have numerous jointed branches growing in rows, or whorls as they are termed, round them; they remain throughout the summer, and in some places form quite a thick cover. Feel how rough the stem is; this is due to the presence of a quantity of silex or flint in it; on this account some of the species are used for polishing purposes. One kind, under the name of "Dutch rushes," is imported from Holland, being used for polishing mahogany, ivory, metal, &c. The horse-tails for the most part grow in moist ground, in ditches and on the borders of lakes; some, however, are common in corn fields and on the roadside. In this country they do not attain a height of more than a few feet, but in tropical countries one or two species grow to the height of sixteen feet or more.

Now for a dip with the bottle in this pond. I will try and catch a few *Hydræ*. Strange animals, indeed, they are, and strange is their history; but let us catch a few first. Nothing yet in my bottle like a hydra. Ah! now we have one or two. You see a small creature sticking to the stem of a bit of duckweed; around its mouth are five or six little projections. At present they are contracted; but the hydra is able to lengthen them out, when they appear as long, thin lines, which are used as the creature's fishing-lines; it is not much larger than a pin's head at present, but it can stretch its body out as it does its lines. I will take a handful

of duckweed, and put it, dripping wet, into this bag, and when we get home we will place the whole in a glass vessel full of water. In the course of half an hour or so, we shall, no doubt, see several hydræ, probably of



HYDRÆ, ON ROOTS OF DUCKWEED.

different species, in various attitudes—some hanging loosely down, others erecting themselves in graceful curves and throwing out their arms or tentacles many times longer than their bodies; others shooting up their arms right above their heads; others contracted, looking like miniature dabs of jelly; others attached head and tail to the side of the glass; others floating on the surface of the water, their tail-ends sticking out and serving to keep them from sinking; some of a beautiful grass-green colour, others light brown or flesh colour,

others almost white, others red. These creatures may be cut into several parts, yet each part will grow again into a perfect animal; young ones bud out of the sides of the parents. Some have said that they can be turned inside out, and find no inconvenience whatever from the operation. "But how," asked Willy, could anybody manage to turn so small a thing as a hydra inside out?" It does seem an impossible task, I confess, and a man must have much skill and patience to enable him to accomplish it. However, I will give you the description of an attempt made many years ago by a celebrated naturalist of Geneva, named Trembley, who made the hydræ or fresh-water polypes a study for many years. This is what Trembley says:—"I begin by giving a worm to the polype on which I wish to make an experiment, and when it is swallowed I begin operations. It is well not to wait till the worm is much digested. I put the polype, whose stomach is well filled, in a little water in the hollow of my left hand; I then press it with a small forceps nearer to the tail end than to the head. In this way I push the swallowed worm against the mouth of the polype, which is thus forced to open, and by again slightly pressing the polype with my forceps I cause the worm partly to come out from its mouth, and thus draw out with it an equal part of the end of its stomach. The worm, coming out of the mouth of the polype, forces it to enlarge itself considerably, especially if it comes out doubled up. When the polype is in this state, I take it gently out of the water, without disturbing anything, and place it on the edge of my hand, which is simply moistened, so that it

may not adhere too closely. I oblige it to contract more and more, and this also enlarges the stomach and mouth. The worm then is partly coming out of the



HYDRA, WITH YOUNG ONES BUDDING OUT FROM ITS SIDE.

mouth, and, keeping it open, I then take in my right hand a hog's bristle, rather thick and without a point, and I hold it as one holds a lancet for bleeding. I bring its thickest end to the hind end of the polype and push it, making it enter into its stomach, which is the more easily done as in that part it is empty and much enlarged. I push on the end of the hog's bristle, which continues to invest the polype. When it reaches the worm, which holds the mouth open, it either pushes the worm or passes by its side, and at last comes out by the mouth, the polype being thus completely turned inside out."

Very strange, indeed, to think that animals with the wrong side outermost should continue to eat, grow, and multiply, as Trembley assures us his specimens did, though, perhaps, we shall not wonder that they often tried to turn themselves back to their original condition, and with success, unless Trembley took steps to prevent them. There are other strange things recorded of the fresh-water polypes, as that different individuals can be grafted together without the slightest inconvenience to any of the parties, the joint-stock company of course being limited.


The hydræ live on small worms, larvæ of gnats, water-fleas, and other minute creatures; they catch them with their tentacles or fishing-lines, and draw them to the mouth. It is maintained by many observers, with good reason, that these arms have the power of paralysing, in an instant, the worms they wrap themselves round. There are at least three well-marked species of hydræ to be met with in the ponds and ditches of this country.

There is the green hydra, the light flesh-coloured or common hydra, and the long-armed hydra, the most interesting of all. See, there is the water-primrose, now in flower, with its delicate pink corolla and bright orange centre. Let us gather a few plants, and then return home.



WALK V.

MAY.

O-DAY we will go to Shawbury and try our luck with the trout. If the fish will not rise there will be plenty to observe, and I have no doubt we shall enjoy the day thoroughly; the wind is in the south-west and the day is cloudy; the May-fly is well out, and I think we have every chance of good sport. Let us look out our fishing-tackle and drive off at once to the river. How delightful it is to stroll by the river side and hear the rippling of the water; delightful, too, is the sensation of feeling at the end of your line the tugs and jumps of a good lively trout. I cannot resist quoting some lines from 'The Angler's Song,' which I think you will say are very pretty:

Merry in the greenwood is the note of horn and hound,
And dull must be the heart of him that leaps not to their sound;
Merry from the stubble whirrs the partridge on her wing,
And blithely doth the hare from her shady cover spring;
But merrier than horn or hound, or stubble's rapid pride,
Is the sport that we court by the gentle river side.

Our art can tell the insect tribe that every month doth bring,
And with a curious wile we know to mock its gauzy wing;
We know what breeze will bid the trout through the curling waters leap,
And we can surely win him from shallow or from deep;
For every cunning fish can we a cunning bait provide,
In the sport that we court by the gentle river side.

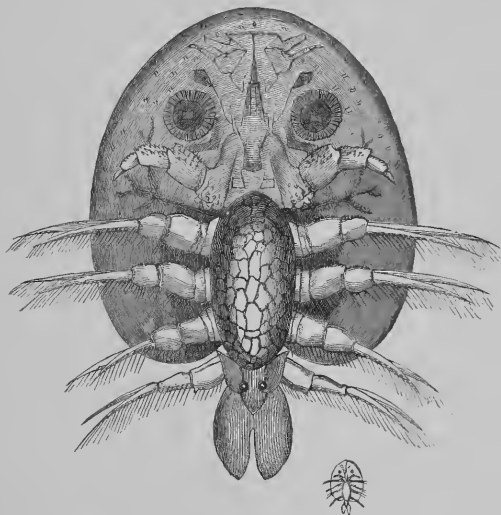
Where may we find the music like the music of the stream?
What diamond like the glances of its ever-changing gleam?
What couch so soft as mossy banks, where through the noontide hours
Our dreamy heads are pillowed on a hundred simple flowers?
While through the crystal stream beneath we mark the fishes glide,
To the sport that we court by the gentle river side?

For as the lark with upland voice the early sun doth greet,
And the nightingale from shadowy boughs her vesper hymn repeat;
For as the pattering shower on the meadow doth descend,
And far as the flitting clouds with the sudden sunbeams blend;
All beauty, joy and harmony, from morn to eventide,
Bless the sport that we court by the gentle river side.

Well, here we are once more at the charming little village of Shawbury. How often, both as a boy and a man, have I wandered by the banks of the river Roden. What changes have taken place since my early rambles! Long familiar forms, companions in my fishing expeditions, have vanished; the mind fondly cherishes their memory, and recalls past hours of cheerful intercourse. We will put up the horse and carriage at the Elephant and Castle Inn and stroll away to the river.

Ah! here is a capital place. Now, Master Willy, there is no tree to interfere with your throw, so cast in just near that spot, quietly, carefully, anxiously; if there is a fish there he cannot resist your green drake. I recommend him the artificial before the fat natural fly. As Christopher North says—"Devouring ephemerals! Can you not suffer the poor insects to sport out their day? They must be insipid eating—but here are some savoury exceedingly . . . they carry *sauce piquante* in their tails. Do try the taste of this bobber—but any of the three you please." There, hold

fast, Willy, for that's a good one. Bring him up carefully to the side; hold your rod erect; play him a little, for he is full of vigour. There! well done; I have got him in the landing net. Is not he a beauty? A pound weight, I'll be bound; and what condition! His flesh will be almost as pink as that of a salmon. Further down stream I managed to take a fish in very different condition; I took him where the river was rather muddy, and flowed very slowly. Just look at him, with a body lean and dark coloured, and an enormous head for so slender a body. "Oh! but, papa," said Willy, "what are these curious creatures crawling



PARASITE (*Argulus foliaceus*) ON TROUT, NAT. SIZE AND MAGNIFIED.

over him? Do look." Ah! I know them well; anglers call them trout lice. I will scrape off a specimen, and put him in the bottle. Now look at him. The body is nearly round, and almost transparent; colour rather green; it has four pairs of swimming feet, each pair beset with a fringe of hairs; a pair of foot-jaws; a small half-cleft tail; and a pair of fleshy circular suckers just in front of the foot-jaws, by means of which the little creature is able to attach itself, as a parasite, upon various fish. It is a graceful little creature, and, as you see, can swim with great activity in the water; now it swims in a straight line, now it suddenly turns quickly round and turns over and over. It is known to naturalists under the name of *Argulus foliaceus*; I do not think it has any English name. It is found on many kinds of fish, and generally in greater abundance upon individuals that are in an unhealthy state; though these parasites often attach themselves to fish in good condition. The mouth is furnished with a long, sharp sucking-tube, by means of which the animal can pierce the skin of the fish it lives upon, and suck up the juices. We will take a few home, and I will show you the different parts of the creature under the microscope.

Let us now sit down and rest for an hour, and eat our lunch; the fish do not rise as freely as they did; perhaps later on they will be in the humour again. But what do I see sticking to the sides of that rail across the river; I must go and see. Well, really this is an interesting thing. An immense mass of flies, a few alive, but the greater number quite dead; and, look!

a quantity of white eggs underneath them. Let us examine a fly; it is of a brown or tawny colour, and has rather long, diverging, colourless wings, marked with irregular brown spots. Why, there must be thousands of dead flies covering these eggs. What an odd idea! Presently up comes Mr. Collins from the farm near the bank of the stream. "Oh, sir, I know those flies quite well; they are oak-flies (*Leptis scolopacea*)."

Certainly not, I replied, though they do somewhat resemble them in colour and appearance; but the farmer stoutly asserted he was right, and I did not think it worth while discussing the matter further with him. Mr. Collins is a good fly-fisherman; and fly-fishermen, unless they are naturalists, are generally very positive. How often have I tried to teach anglers that the May-fly does not come from a caddis worm; how often have I failed! Well, the two-winged fly I have just found in such thousands, with their dead bodies brooding over this mass of eggs, is known to entomologists by the name of *Atherix Ibis*; the females are gregarious, and, as we have seen, attach their eggs to rails, boughs, or other objects overhanging streams; each female, having laid her eggs, remains there and dies; shortly after comes another and does the same, and so on till immense clusters are formed. The larva, when hatched, falls into the water, its future residence; it is said to have a forked tail about one third the length of its body, and to "have the power of raising itself in the water by an incessant undulating motion in a vertical plane." I am not, however, acquainted with either larva or pupa, but hope to become so this

summer. "It is very curious, papa," said Jack, "that the flies, after they have laid their eggs, should die there; why do not they fly away? Do any other animals do the same?" Yes, pretty much so. Some of the female insects of the genus called *Coccus*, scale insect, or mealy bug, common on the stems of various trees, to which they sometimes do incredible mischief, lay their eggs and die over them, the dead bodies of the parents forming coverings for the young. See how fast the green drake is appearing. Notice how it flies with head erect for a second or two, and then falls almost helplessly on the surface of the water.

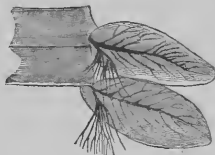
There! did you see that fish rise at him? He has escaped the hungry trout, and has reached a blade of grass, where he will probably rest for some hours. But give me my rod; perhaps the same trout will rise at my artificial fly. There! that throw was exactly over the spot. No; he won't have it. I'll try again and again. No. Objects to *sauce piquante*, I suppose. Well, I will tempt him again in an hour's time or so. The water is smooth here, and free from rapids; let us lie down on the grass and see the birth of *Ephemera*—for that is the May-fly's proper name. Here comes something floating down. It is within the reach of my hand, so I will secure it. What is it? As I thought. *Ephemera* is throwing off its swaddling clothes. See how it twirls and twists itself about. Now it is free; and the strange-looking worm has changed into a beautiful fly. But there is yet one other operation to go through ere it assumes its final and complete form; you see at present it is a heavy

flier, for the wings are scarcely dry, and the muscles as yet unequal to great exertion; so in their present imperfect form they are constantly dropping for a second or two in the water, and are often sucked down the throat of some roach, trout, or other fish on the look-out. You should remember that the *Ephemera*, or May-fly, in this its *sub-imago*, or imperfect winged state, represents the "green drake" of the angler. What have I here on this blade of grass? Do you see? What is the shadowy form that lifelessly clings to it? It is a delicate membrane, thin and light; see, I blow it away. You saw the split in the back, through which the former tenant left the abode. It is the cast-off skin of the green drake, now metamorphosed into a creature more active than harlequin or columbine, the male into a dark brown insect, with gauze-like wings, the female into a beautiful creature, with body marbled white and brown, and able to fly well and strongly, now high in the air, now sailing along close to the surface of the water, ever and anon dipping gently into it for the purpose of laying her eggs. The small oval eggs sink down to the bottom, and attach themselves to the weeds and stones that are found there. The flight of the male *Ephemera* is different; it is the males that practise together that peculiar up-and-down dance, with heads erect and bodies curving prettily upwards; of course, you can understand how countless multitudes fall victims to fish and bird, for dainty morsels they are. These flies, though voracious feeders both in the larval and nymphal state, never eat at all after they have assumed

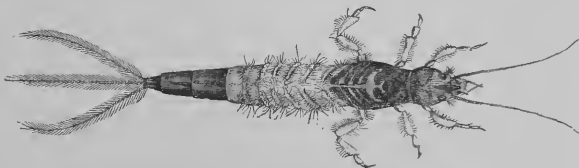
their perfect form. Indeed, they have no true mouth, only an imperfect or rudimentary one; and you would never find a particle of food in their stomachs, which are always more or less full of air-bubbles, which, no doubt, assist in buoying up the insect, and thus save the expenditure of muscular power. I'll catch one of those dancing males, and press him quickly in the middle. There! crack he goes! for the little air-bubbles in the stomach have burst by the pressure of my finger and thumb.

Abundant as are the May-flies at the latter end of May and the beginning of June in this country, in other countries they are sometimes more astonishingly numerous. In some parts of Holland, Switzerland, and France, their great numbers have been compared to pelting flakes of snow. "The myriads of Ephemerae which filled the air," says Reaumur, "over the current of the river and over the bank on which I stood, are neither to be expressed nor conceived. When the snow falls, with the largest flakes and with the least interval between them, the air is not so full of them as that which surrounded the Ephemerae." The occurrence of such prodigious numbers is, I believe, unknown in the British isles. In the perfect or *imago* state the May-fly lives but a short time. The word *ephemera* means "living only for a day;" and though individuals may live longer, yet the term is fairly correct as expressing their short existence. The May-flies (*Ephemerae*) have all three long fine hairs at the end of the tail; some members of the same family, but belonging to a different genus, have only two hair-like appendages.

For instance, the fly known to fishermen as the “March-brown” belongs to the same family as the May-fly; it is smaller than it, and has only two hairs at the end of the tail; but with this exception, the natural March-brown and the May-fly are wonderfully alike; yet it is most curious to notice what a wonderful difference there is in the larvæ of these two insects. Significant facts, no doubt, lie at the bottom of such differences in the case of insects so evidently allied, but these I will not speak of. Here are the two forms of larvæ, the one being the larva of the common May-fly (*Ephe-*



LARVA OF BAËTIS, WITH BREATHING PADDLES, MAGNIFIED.



LARVA OF EPHEMERA, OR MAY-FLY, MAGNIFIED TWO DIAMETERS.

mera), the other that of the March-brown (*Baëtis*). Come, we have lunched, and rested, and watched the May-flies; let us try to catch a few more trout. It is very strange why sometimes the fish will not rise, though the weather is propitious and the water in first-rate order. Holloa! master Willy, what game are you after now? "Oh, papa," he exclaimed, "there are a lot of dace on this shallow, so I put the spinning hooks on, and, see, I have managed to hook a couple out, by simply throwing the tackle on the other side of the fish and then drawing it smartly through the water over them." Well, that looks like a bit of poaching, at all events; the fish are spawning amongst that water crow-foot, no doubt; just hook out some weed, and I dare say we shall see some eggs. To be sure; there they are, dotted over the long thread-like leaves of the plant, like little pearls. You have caught enough, for I think it is not sportsmanlike conduct to take such unfair advantage of the unfortunate dace. Put on your casting line and try under the old forge bridge. You think there is not much use? A true fly-fisherman should never say so. I have taken many a trout under the bridge, and I dare say you may be successful this time. There! I told you so. Keep your line tight, and Jack shall land him. He is not a large fish evidently, but very lively. Now you have him, throw him on the grass. Are there any parasites on him? Yes; but different to the last we observed. Here is a leech-like creature, rather small and cylindrical; it is the *Piscicola*, a not uncommon parasitic leech on fish. Well, put him into the bottle; we can take him home

and examine him at leisure. How many trout have we taken now? "We have got nine, papa, and, remember, I have caught three." Yes; but I suppose you include the poaching? "No; I have caught three trout with the fly, and I don't count the dace." Not a bad day's sport, after all; for I threw back again three small fish. What is this showy plant, with large, yellow, globe-like blossoms? How pretty it is, growing in abundance in a little spot near the river! It is the globe flower, so called from the rounded shape of the corolla; it is one of the buttercup family, as you will, perhaps, guess. In its wild state I believe it is found in mountain districts, so I suspect it has found its way here from some of the cottage gardens which are only a quarter of a mile distant. We will grub up a few roots; perhaps Mrs. Charlton would like them for her wild garden shrubbery. When you go a-fishing always be provided, if not inconvenient, with a trowel and a small basket, as well as with a few wide-mouthed bottles; they will be very useful, especially if the trout will not rise. The trowel and basket you can leave at a cottager's house, and the bottles are indispensable to every angler-naturalist. What are you running after, Jacko? Oh! I see; one of the most beautiful insects that are found in this country. Ah! he is too quick for you. It is the brilliant steel-blue dragon-fly. Let us sit down for a few minutes and watch its flight. How rapidly it flies, now pursuing the course of the river, now suddenly darting back again. It is the *Agrion virgo*, the most splendid of all the dragon-flies, even rivalling the gorgeously coloured

insects of tropical countries. All the dragon-flies proceed from water larvæ; strange creatures of unbecoming forms and ferocious dispositions. The mouth, or rather the lower lip of the larva is of very singular form. Two jaw-like organs are at the end of the lip, its basal portion being articulated to the head; this mask, as it has been called, is folded beneath the head when in repose, but it can be suddenly shot out in front of the head so as to seize any small creatures that may pass near it which the larva thinks good to eat. Imagine one of your arms being joined on to your chin, bend your elbow up till your hand covers your face—this will represent the dragon larva with the mask in repose; now shoot out your arm in a straight line from the head—this will represent the mask unfolded and in use; your fingers may be considered to represent the jaws of the creature. When the larva wishes to turn into an insect, it leaves the water and creeps up the stem of some water weed or other object out of the water, bursts its skin, and commences its new state of existence. If we look about us near the water side, we shall be sure to find some empty pupa skins. Here are two on this sedge; you see a slit on the back through which the dragon-fly has come out. The dragon-flies are the largest and most active of our British insects, and, to quote the descriptive words of Professor Rymer Jones, “are pre-eminently distinguished by the rapidity of their flight and the steadiness of their evolutions while ‘hawking’ for prey in the vicinity of ponds and marshy grounds, where in hot summer weather they are everywhere to be met with. Equally

conspicuous from their extreme activity, their gorgeous colours, and the exquisite structure of their wings, they might be regarded as the monarchs of the insect race. The very names selected for them by entomologists would testify the perfection of their attributes; their titles ranging from that of *Anax imperator*, indicative of imperial sway, to epithets expressive of feminine delicacy and ladylike grace, such as *virgo*, *puella*, *demoiselle*, and *damsel-fly*, which are appropriated to the sylph-like forms that many of them exhibit. In their habits, however, they by no means deserve the gentle appellations bestowed upon them. They are, in truth, the tigers of the insect world, and their whole lives are devoted to bloodshed and rapine. Indomitable in their strength of wing, furnished with tremendous jaws, and possessed of acuteness of sight and rapidity of motion scarcely to be paralleled, there seems to be no escape from their ferocity, and terrible is the slaughter they effect amongst the insect legions they are appointed to destroy." It must not, however, be supposed from the above description that the dragon-flies are creatures that deserve to be killed. On the contrary, they are most serviceable to men, and destroy countless numbers of injurious flies and butterflies whose larvæ do damage to vegetation. "Well, papa," said Jack, "the boys in the village always kill them if they can catch them, and say they sting horses." I know that this is a popular tradition, inherited by the rural folks of our day from their great-great-grandmothers' grandmothers. Dragon-flies are often called *horse stingers*; in America they are sometimes called *devil's darn-*

ing-needles; in Scotland, I believe, they are known by the name of *flying adders*. Where is my net? I will try and catch a demoiselle. There! I have her, or I should rather say *him*, for these dark spots on the wings disclose the sex; the female has unspotted wings, and is of a rich green colour. "How splendidly it shines in the sun," said Willy; "nothing can exceed the beauty of its wings." Well, now you have looked at him closely and admired him, I will let him go again. Off he flies, none the worse for his temporary captivity. Now for my friend the trout, who would not take my fly an hour ago. Ah! I have got him the first throw; see how he jumps. Now, Willy, for the landing-net. Bravo! all safe, and a good fish too. Our sport is over for the day, and we must get ready to drive home. To-morrow, Willy, you may learn these lines from Thomson's 'Seasons:'

"When with his lively ray the potent sun
Has pierced the stream and roused the finny race,
Then, issuing cheerful, to thy sport repair;
Chief should the western breezes curling play,
And light o'er ether bear the shadowy clouds.
Just in the dubious point where with the pool
Is mixed the trembling stream, or where it boils
Around the stone, or from the hollowed bank
Reverted plays in undulating flow,
There throw, nice judging, the delusive fly;
And as you lead it round in artful curve
With eye attentive mark the springing game,
Straight as above the surface of the flood
They wanton rise, or urged by hunger leap,
Then fix with gentle twitch, the barbed hook.
Some lightly tossing to the grassy bank,
And to the shelving shore slow-dragging some,
With various hand proportioned to their force.

If yet too young and easily deceived,
A worthless prey scarce bends your pliant rod ;
Him, piteous of his youth, and the short space
He has enjoyed the vital light of heaven,
Soft disengage, and back into the stream
The speckled captive throw. But should you lure
From his dark haunt, beneath the tangled roots
Of pendent trees, the monarch of the brook,
Behoves you then to ply your finest art.
Long time he, following cautious, scans the fly ;
And oft attempts to seize it, but as oft
The dimpled water speaks his jealous fear.
At last, while haply o'er the shaded sun
Passes a cloud, he desperate takes the leap,
With sullen plunge. At once he darts along,
Deep struck, and runs out all the lengthened line ;
Then seeks the furthest ooze, the sheltering weed,
The caverned bank, his old secure abode,
And flies aloft, and flounces round the pool,
Indignant of the guile. With yielding hand,
That feels him still, yet to his furious course
Gives way, you, now retiring, following now
Across the stream, exhaust his idle rage ;
Till, floating broad upon his breathless side,
And to his fate abandoned, to the shore
You gaily drag your unresisting prize."


There is some good advice here worth remembering ;
at any rate, persevere, persevere, and no doubt you will
become in time



A MOST SUCCESSFUL ANGLER.

WALK VI.

JUNE.

E had many pleasant rambles last autumn," said Willy, "in search of fungi. How I wish the time was come when we could hunt for fungi again. Think of the woods at the bottom of the Wrekin, and those delightful fir plantations near Tibberton. Besides you know some kinds are so good broiled for breakfast. I often think of fungus-hunting. When shall we be able to go out hunting again?"

September and October are the best months, but we shall meet with fungi earlier. However, I will promise you a long day's ramble or two in search of fungi when the time comes. In the mean time let us keep our eyes open, and I dare say we shall even now, in the month of June, meet with a few interesting species. We will go into some of the meadows near home to-day, and I am much mistaken if we shall not be able to find St. George's mushroom. It is a very delicious fungus, and perfectly wholesome. I gathered a few specimens the other day, and now that the weather is warm, I doubt not we shall meet a good number; so, besides collecting bottles, we will take a basket, and Jack shall be the carrier. Now separate



yourselves and search this pasture well. "Here are a lot of fungi growing in a ring," exclaimed May. Let me look. You have found what we wanted. This fungus is the *Agaricus gambosus*, or St. George's mushroom. See how closely the gills are set together; they are yellowish-white in colour; the top is thick and fleshy; the stem, too, is very thick. Few fungi, comparatively speaking, grow so early in the year, and you could not mistake *gambosus* for any other kind. What? You think the smell rather strong. Well, I confess this fungus has a strong and not a very pleasant odour. Put what you have collected into the basket; you will find that the taste is better than the smell. Here are some specimens with the top cracked and split; these are a little older, but they are very good. We will put them with the rest. "Oh, papa," exclaimed Jack, "I was looking at that ash tree in the hedge, and I thought I saw a mouse run up the trunk." I suspect it was not a mouse, but a bird, called, from its habit of running up trees, the tree-creeper. Let us get a little nearer. I see I am right; there the little bird is, running rapidly up the tree; now he stops, as if examining the bark; now he is off again. How very like a mouse, to be sure! It is one of the smallest of our British birds, and, though common enough, is not very often seen, except by those who, caring for such things, use their eyes well. Now he has gone to the opposite side of the tree; off he goes again and explores another trunk. By means of its long curved claws and stiff forked tail-feathers, this prettily marked bird is enabled to climb with great

rapidity. It remains in this country all the year, and is more abundant in plantations and parks where there are plenty of trees. It makes its nest in a hollow tree, or on the inner side of the bark of a decayed one. The little bird lays many eggs, from six to nine, in the month of April; they are nearly white, with a few pinkish spots, generally at the larger end of the egg. It utters a few pleasing but feeble notes. The young ones are, as you may suppose, tiny little things. You should notice the curved pointed beak of this bird, and the stiff tail-feathers it presses against the tree as a fulcrum to aid it in its ascent.

We will go into this adjoining field, which will soon be ready to mow. We will keep by the hedge—for it would not be right to trample down the tall grass—and gather a few grasses. Few people know more about grass than that it is good pasturage for cattle and sheep. Let us gather a lot, and take care, as far as we can, to gather only one kind each. How graceful and beautiful they are, and what difference there is amongst them; some have a stiff spike-like head of flowers, others have pretty drooping heads; some are harsh and rough to the touch, others soft as satin. Some, again, are of great value as pasturage and for making into hay; others are positively noxious weeds. You know the twitch or couch grass, that gives the farmer so much trouble; it is most rapid in its growth and difficult to kill; its underground creeping stems spread in all directions, and, if left to itself, would soon take sole possession of the whole soil. So the farmers are very careful to rake together all they can; they

then collect it in heaps and burn it. Here is the rough "cocksfoot grass," with its head or "panicle"



PANICLE OF GRASS.

as it is called, upright and tufted. Look at its large yellow stamens; it is a very productive species and enters largely into all hay-grass. Here is the common quaking grass, with its slender, smooth, spreading branches. See how the numerous little heads tremble with the slightest motion; we do not see much of it in these meadows. It is an exceedingly pretty grass, and often seen on the chimney-pieces of cottagers, but is by no means a valuable agricultural grass; on the contrary, it is a sign, when abundant, of poor land. Here we have the smooth-stalked meadow grass, and here is the hedge wood-melic grass, with its slightly drooping panicle, and spikelets on long slender foot-stalks. Here is the soft meadow grass; feel how smooth its panicle is; this, the oat-like grass. "What is that very tall grass," asked Willy, "that often grows near the water? It is much taller than you are, and has a rich brown drooping head." You mean the common reed-grass, no doubt; it is not yet in flower, but you will see it in August and September. It is a magnificent grass, though not of much use to the farmer. The little birds find shelter amongst its stems, and the reed-warbler often chooses them as pillars whereon to support its nest. Then you must not forget another tall and handsome grass, often found on the banks of rivers and lakes, called the reed-canary grass; it flowers about the middle of July. You know the ribbon-grass, in the garden, with its leaves striped with green and white, varying immensely in the width of its bands, so that you can never find two leaves exactly alike. "Yes, indeed, papa," said May, "I

know it well; you know we always put some with the flowers we gather for the drawing-room table." Well, this is only a cultivated variety of the reed-canary grass; and I have sometimes let a cluster of the ribbon-grass run wild as it were, and then the leaves turn to one uniform green. The reed-meadow grass is another tall and handsome kind; this cattle are very fond of; it is sweet to the taste and grows in damp situations. "You sometimes see," said May, "a very beautiful and curious grass, with long yellow feathery tails, amongst the ornaments in rooms." That is the "feather-grass;" it is a very rare grass, and has been seldom found wild in this country. The long yellow tails are the awns, which resemble delicate feathers. Here is the sweet-scented vernal grass; taste and see how pleasant it is; it is the grass which, perhaps more than any other, gives that charming odour to the hayfields. "There is a clear pond in yonder corner of the field, let us go there and see what we can find," said Willy. All right. It is a very likely pond for many interesting creatures; but let us first look at the plants that grow round or in it. There are a few sedges here and there—a pretty order of plants; at present you must be content with making yourselves acquainted with their general form. Take care how you gather them, for the leaves and stems of some kinds are very rough, and if you draw them quickly through your hand you may cut it rather sorely. "Oh! do come here, papa," said May; "here is quite a new flower to me; is it not a beauty?" Indeed, it is a lovely plant; it is the buckbean or marsh-

trefoil, and generally grows in some boggy spot, such as this. Look at the three green leaflets, like those of the common bean—hence one of the names of the plant. Look again at the clusters of blossoms; some are not fully out, and are of a lovely rose colour; others are quite out, and the flowers covered with a white silken fringe. Bite a bit, and taste how bitter it is; people often gather the roots and use them as a tonic medicine. I think in some countries, as in Norway and in Germany, the leaves have been used in the place of hops for brewing beer; about a couple of ounces being equal to a couple of pounds of hops. The late Sir William Hooker found the buckbean very plentiful in Iceland, and says that where it occurs it is of great use to travellers over the morasses, for they are aware that the thickly entangled roots make a safe bed under the soft morass for them to pass over. Here is hairy mint, nearly a foot high; do you dislike the smell? I think it pleasant myself; it is not yet in flower, but will be so in about six weeks' time. Holloa! Jack, what's the matter? "I have only tumbled down, papa, amongst these nasty nettles, and got stung rather sharply." That is interesting. Do you know how it is that nettles sting? "Oh, papa," said Jack, pitifully, "you are like the man in the fable who was giving a lecture to the drowning boy; the boy asked him to get him first of all out of the water, and to give him the lecture afterwards. Now, you should first tell me how to cure these nettle stings, and I would then be more inclined to learn how it is that nettles sting." The pain will soon pass off, and I do not know that

there is any remedy. When at school, I was told to rub the stung part over with a dock leaf, but I do not think this ever did it any good. Now, I want you to



NETTLE.

pay particular attention ; you know what we call “the dead nettle”—I mean what plant I allude to ; there is the red, white, and yellow so-called dead nettles ; you remember the shape of the flowers of these three kinds. Look at the flowers of the real stinging nettles ; are they

not extremely unlike? You see the small green flowers in long branched clusters; how different from the lip-shaped flower of the dead nettles. There is some



DEAD NETTLE.

general resemblance, however, between the real nettles and the so-called dead nettles; the leaves for instance of the white dead nettle are very like those of the stinger. The dead nettles, however, are not at all related to the true nettle, and belong to quite a different family called the Labiate tribe, from the Latin word *Labium*, "a lip," in allusion to the form of the corolla. Is the pain better, now, Jacko? "Yes, it is getting less severe; look what large white lumps have

arisen on the back of my hand." The sting of the



LABIATE PLANT.

a. Stamens. *b.* Corolla. *c.* Calyx.

nettle is a very curious and interesting object under the microscope. It consists of a hollow tube with a



STING OF NETTLE, MAGNIFIED.

glandular organ at the bottom of it, in which is contained an acrid fluid very irritating to the skin;

the fine point of the sting or hair pierces the skin, and the pressure forces up the fluid from the bottom of the hair, which is then conveyed into the wound by a point at the top of the sting. The nettles of foreign countries have much greater poisonous properties. The effects of incautiously handling some East Indian species are terrible. The first pain is compared with the pain inflicted by a red-hot iron; this increases and continues for days. A French botanist was once stung by one of these nettles in the Botanical Gardens of Calcutta; he says the pain so affected the lower part of his face that he feared lock-jaw. He did not get rid of the pain till nine days had expired. Dr. Hooker saw gigantic nettles in Nepal, one was a shrubby species growing fifteen feet high, called by the natives *mealum-ma*. They had so great a dread of it that Dr. Hooker could hardly persuade them to help him to cut it down. He gathered several specimens without allowing any part to touch his skin, but the "scentless effluvium" was so powerful as to cause unpleasant effects for the rest of the day. "The sting produces violent inflammation, and to punish a child with *mealum-ma* is the severest Lepcha threat." Then there is the nettle of Timor, or *devils-leaf*, the sting of which sometimes produces fatal effects. Tree-nettles in Australia are occasionally found as much as twenty-five feet in circumference. There are three species of stinging nettles in this country, the great nettle, the small nettle, and the Roman nettle; the first two are very common, the last very rare indeed. There is a curious story told of the introduction of this last

species into this country. You may believe as much as you please of it. It is said that before the Romans under Julius Cæsar thought it prudent to come to England—of the coldness of which they had heard a good deal—they procured some seeds of the Roman nettle, intending to sow them when they landed in this country; so when they landed at Romney, in Kent, they sowed the seeds. “And what use, papa,” asked Willy, “would nettles be to them during the cold weather in England?” Well, they meant to nettle themselves, and so chafe their skins so as to enable them to bear the cold better. And tough skins they must have had, for the poison of the Roman nettle is much more severe than that of the two common species. Camden, I believe, tells the story; as I said, you may believe it or not. Do you see that tortoiseshell butterfly hovering near the nettles? Its larva was a greenish-black caterpillar with yellow stripes, and it lived, when in that state, entirely on the leaves of the nettle; the larvæ also of other kinds of butterflies feed on this plant, as the admiral butterfly, and the peacock butterfly. I have eaten the young shoots of the common nettles in the spring of the year; they do not make a bad substitute for spinach.

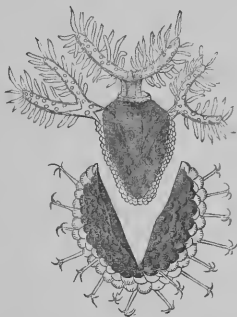
How prettily the yellow flags skirt the pool; there, you see, is the common branched bur-reed, with its sword-like leaves and round heads of flowers; a little way in the pool is the pretty arrowhead with its large conspicuous arrow-shaped leaves and flesh-coloured flowers, both leaves and flowers standing several inches out of the water. In the water, too, I see the brown



LARVA, CHRYSALIS, AND INSECT OF THE SMALL TORTOISE-SHELL
BUTTERFLY. (*Vanessa urticae*.)

leaves of the perfoliate pondweed; they are almost transparent, and look when dry something like gold-beater's skin. I see also the cylindrical tufts of the horn-wort with its bristle-like leaves often several times forked. It grows entirely under the water. See also a few rose-coloured spikes of the amphibious persicaria.

Such are some of the most conspicuous plants near our pond. It looks likely to contain some fresh-water polyzoa, than which there are few more beautiful tenants of the water. Here is a young one on this leaf of persicaria; do you see it? I put it into my bottle. Now look, it has lately been hatched from that round egg with curious hooks around its margin. It is called *Cristatella*. At present there are only three individuals in the outer



YOUNG CRISTATELLA, MAGNIFIED.

heart-shaped covering, but additional ones will bud out of these three, and others from these last, till the whole colony may number as many as sixty individuals, being then fully an inch long; the mouth of each is placed between the tentacles, which have upon them,

running down each side, a great number of very minute hairs or *cilia*, to which, you may remember, I have alluded before. The colour of the colony is yellowish white, sometimes brownish white. It is a most exquisite little animal, or rather colony of animals; for, though there are several creatures in one house, as it were, each is separate and independent of its neighbour. You will often find other forms of polyzoa in clear ponds and mill-pools; sometimes you would suppose you were looking at a mass of sponge, as in the case of *Alcyonella*, or the creeping root of some weed, as in *Plumatella* and *Fredericella*; but when the sponge-like mass or rootlets are placed in water you will observe numbers of little animals to show their heads and tentacles above the mass or from the little holes in the creeping rootlets. Ah! what have we here? Do you see those long narrow ribbons of floating grass about a yard from us? Do you notice some of the ribbons to be bent and folded here and there? Between each fold we shall find an egg of a newt. Let me get this bit of grass ribbon. There, I unfold it where it is creased, and you see a transparent glairy substance, within which is a round yellowish egg. Here again is another. The leaves of *persicaria*, also, are often selected by the female newt for the purpose of depositing her eggs. Here you see is a leaf folded up; between the folds is another newt's egg. I have never seen the newt in the act of laying her eggs, but, I believe, it may readily be observed by placing a female newt any time during the months of May and June in a vessel of water with some leaves of *persicaria*. Mr. Bell says, "The manner in

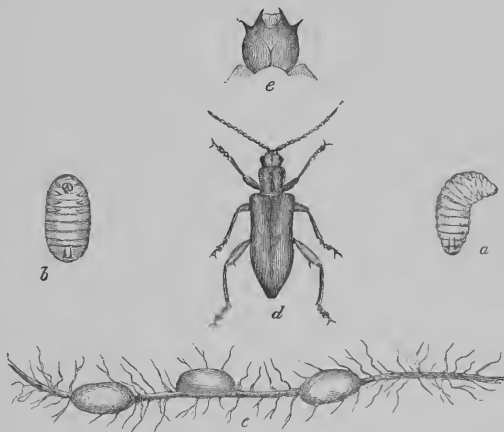
which the eggs are deposited is very interesting and curious. The female, selecting some leaf of an aquatic plant, sits as it were upon its edge, and folding it by means of her two hind feet, deposits a single egg in the duplicature of the folded part of the leaf, which is thereby glued most securely together, and the egg is thus effectually protected from injury. As soon as the female has in this way deposited a single egg, she quits the leaf, and after the lapse of a short time seeks another, there to place another egg." The eggs undergo various changes, and the animal, at an early part of its life, has a pair of delicate organs on each side of the neck; these are rudimentary gills, by means of which the little creature breathes. In its very early condition these gills are simple lobes; I ought to say that the first pair of lobes serve the purpose of holders by which the little creature attaches itself to leaves and other things. But when it is about three weeks old the gills have many leaf-like divisions, and look like beautiful feathered fringes. The circulation of blood in these gills may be readily seen under the microscope, and will be surveyed with the greatest delight. By-and-bye the animal buds out its four legs and looses the gills; they do not drop off, but become absorbed; hitherto it has carried on its respiration or breathing by means of these gills, but how does it breathe now that it has lost them? The lungs in the inside of the body have been gradually growing larger and fit for breathing the atmospheric air; for newts, when arrived at their full or perfect state, are, you know, chiefly terrestrial creatures, and breathe by means of their

lungs. When young they are in a fish state, and breathe the air contained in the water exactly as fish do. If you will look at a pond where newts abound, you will see the old ones constantly coming to the top of the water, gulping down a mouthful of air and then returning to the bottom. Full-grown newts do not frequent the water excepting for the sake of laying their eggs. The young ones are ready for leaving the water in the autumn, but I have often obtained young newts with their gills fully developed in the depth of winter. Probably these had been hatched late in the summer and had not time to grow their lungs, so had to keep to their gills and lead the life of a fish during the winter.

“People often call newts ‘askers,’ papa,” said Willy, “and the lads of the village always kill them when they catch them; they say their bite is poisonous.” I am sorry to say they do; but it is an error to suppose their bite is poisonous. You have yourself handled many specimens, and I am sure you never saw one attempt to bite. I do not believe their small teeth and weak jaws could pierce the skin. Four species of newts have been described as occurring in this country—the two common kinds are the smooth newt and the warty newt. I think I once found the palmated newt near Eytton; the male of this species is distinguished from other newts by having the hind legs webbed and by a thin filament or thread at the end of the tail.

“What is this, papa,” said Jack, “that I have found sticking to the roots of this water-weed; they look like the eggs of some creature?” They are not eggs, but the cocoons of a very common but pretty beetle called

Donacia. See, I will slit one open with my penknife. There is the little animal inside, a white, fat, maggoty thing ; it has two curious hooks at the end of the tail,



DONACIA.


a, b. Larvæ, nat. size. *c.* Cocoons on root, nat. size. *d.* Beetle, slightly magnified. *e.* Head of larva.

it has only just framed its cell, and is about to change from the larval to the pupal state. Here you see are other maggots among the roots ; they have not yet made a cocoon. I will open some more ; here is one in its pupal condition. Here is another almost ready to come out as a beetle. The *Donacia* have all a metallic appearance and very beautiful they are, whether blue, red, copper, or purple ; the under side is covered with a fine silky down. They are found in great numbers on water-weeds, and being very sluggish are

readily caught or picked off the plants they frequent with the hand. Do you notice those small, flat, brown or black dabs so common on almost any water-weed you pluck up? These are planarian worms, and though not of prepossessing appearance generally, are extremely interesting animals to study. These large, reddish, oval or round cocoons are the eggs of the planariæ. Here is one of the largest of the family. It is of a milk-white colour, beautifully marked with delicate tree-like branches; sometimes this species (*Planaria lactea*) is of a light pink colour. The mouth is not situated where mouths usually are, in the fore part of the body, but almost in the centre. See, I will place this white planaria on my hand; do you notice that it protrudes something you might perhaps say was its tongue? It is not its tongue, however; it is a tubular proboscis, and is very strong and muscular, and unlike the soft body of the animal. By means of this proboscis the creature is enabled to pierce the bodies of other creatures and to suck out their juices. I have kept planariæ under observation, and seen them drive this proboscis through each other. These black and brown dabs often feed upon the milky planariæ. They are something like the hydræ in their power of producing lost portions of their bodies. Cut them in two or more pieces, each piece will grow into a perfect planaria again. These you see do not swim but crawl, or glide over the surface of plants in the water. Some kinds, however, different from these, are able to swim well. We have had a long and successful hunt to-day. Let us go.

WALK VII.

JUNE.

 HIS morning, before we started for our walk, we went to look at a hedgehog which had been brought to us the preceding day. We discovered that the animal, in the course of the night, had crept into a bag with a quantity of bran in it, and that there were four little ones with her. There they were as snug as possible, the mother and little urchins! Very curious little animals too these young hedgehogs. The spines or prickles were nearly white and soft, and were not spread over the whole body, but arranged in rows down it. The appearance was that of a plucked duckling when it is what is called "penny." They were perfectly blind, and the passage of the ear was quite closed; they uttered faint, puppy-like cries. I was desirous to try and rear them; but I had grave doubts about the old one, for those who have attempted to rear young hedgehogs have generally found that the mother ate her offspring. We removed her, young and all, to another place, giving them plenty of straw and supplying bread and milk for the old one. Buffon, amongst others, relates "that he had repeatedly placed the mother with the young in a place of confinement; but that, instead of suckling them, she invariably killed

and devoured them, notwithstanding that she was provided with plenty of food."

However, we determined to give our young urchins a chance, and hoped the mother hedgehog would be favorably disposed towards her offspring; so we now left her undisturbed. Willy wished to know whether hedgehogs were injurious creatures, for "you know, papa," he said, "that country lads and gamekeepers always kill them whenever they have a chance." I am convinced that hedgehogs do much more good than harm, by the destruction they cause to insects, slugs, snails, field-mice, and other pests of the farm. There is a foolish idea in the minds of the uneducated that these animals suck cows. You have only to laugh at such an absurdity; but I doubt you will scarcely ever succeed in persuading such people that the idea is a ridiculous one, and utterly unsupported by fact. Hedgehogs will undoubtedly destroy eggs, and one can understand why gamekeepers wage war against them, fearing for the safety of the eggs or young birds of their favorite partridges or pheasants. This is natural. I suspect, however, that hedgehogs seldom molest the nests, and that the injury they do in this respect is very small. "But you know, papa," said Jack, "that they will eat young birds. Do you not remember the dead sparrow we once gave to a hedgehog, and how furiously he went at it, and how soon he ate it all up except the feathers." "Yes," added Willy, "and do you not also remember our putting a toad in the same box with a hedgehog? Oh! how angry he seemed, and how savagely he shook the unfortunate toad! He did not,

however, seem to like the flavour, and soon gave up the fight." Hedgehogs will certainly destroy young birds; but we must remember to set the good any animal does against the harm, and strike the balance; and, as I said, I suspect in this case the good will largely preponderate. Hedgehogs are extremely fond of beetles; they seize on them with great earnestness, and crack them with as much delight as you lads crack nuts. Hedgehogs are sometimes kept in houses for the purpose of eating the cockroaches so often abounding in kitchens. Snakes are also devoured by hedgehogs. The late Professor Buckland, having occasion to suspect that hedgehogs sometimes preyed on snakes, "procured a common snake and also a hedgehog, and put them in a box together. Whether or not the latter recognised its enemy was not apparent; it did not dart from the hedgehog, but kept creeping gently round the box. The hedgehog was rolled up, and did not appear to see the snake. The professor then laid the hedgehog on the snake, with that part of the ball where the head and tail meet downwards, and touching it. The snake proceeded to crawl; the hedgehog started, opened slightly, and seeing what was under it gave the snake a hard bite, and instantly rolled itself up again. It soon opened a second, and again a third time, repeating the bite. This done, the hedgehog stood by the snake's side, and passed the whole body of the snake successively through its jaws, cracking it, and breaking the bones at intervals of half an inch or more, by which operation the snake was rendered motionless. The hedgehog then placed itself at the tip of the snake's

tail, and began to eat upwards, as one would eat a radish, without intermission, but slowly, till half of the snake was devoured. The following morning the remaining half was also completely eaten up." When rather young these animals make very interesting pets; they soon become tame, and will allow you to stroke their cheeks. You remember our placing a hedgehog on the study table, and seeing how it got off on to the ground. It came to the edge, and threw itself off, coiling up its body partly as it fell; the elastic nature of its prickly covering enabling it to bear the shock of the fall without the slightest inconvenience.

Let us go on the moors again, and watch the coots and water-hens in the reedy pools near the aqueduct. Do you see that great tit on a branch of this poplar? He is actually at work doing a bit of butchery on a small warbler. See how he is beating the poor little fellow on the head; he wants to get at his brains. "Are there not birds called butcher-birds?" asked Willy, "that fix their victims on thorns, and then peck off their flesh? Shall we see any of them?" There are three kinds of butcher-birds that have been known to come to this country. Two kinds are very uncommon, and we are not likely to meet with any of them in our walks. I may as well, however, tell you something about them; but, as I have no personal knowledge of the habits of any of the species, I must get my information from other sources. The great grey shrike, the red-backed shrike, and the woodchat shrike, are the three species of the family occurring in Great Britain; the red-backed shrike is the only tolerably common one,



arriving in this country late in April, and quitting it in September. Mr. John Shaw tells me this bird visits the quarry grounds at Shrewsbury every spring, and an early riser, if he goes there, can see these birds readily. Mr. Yarrell says that the great grey shrike is only an occasional visitor to this country, and is generally obtained between autumn and spring. Its food consists of mice, shrews, small birds, frogs, lizards, and large insects. "After having killed its prey, it fixes the body in a forked branch, or upon a sharp thorn, the more readily to pull off small pieces from it." The following remarks are by a gentleman who had one of these birds in confinement:—"An old bird of this species," he says, taken near Norwich in October, 1835, lived in my possession twelve months. It became very tame, and would readily take its food from my hands. When a bird was given it, it invariably broke the skull, and generally ate the head first. It sometimes held the bird in its claws, and pulled it to pieces in the manner of hawks, but seemed to prefer forcing part of it through the wires, then pulling at it. It always hung what it could not eat up on the sides of the cage. It would often eat three small birds in a day. In the spring it was very noisy, one of its notes a little resembling the cry of the kestrel." It is as cunning as well as a bold bird. It is said that by imitating the notes of some of the smaller birds it calls them near it, and then pounces upon some deluded victim. The shrike is used by falconers abroad for trapping falcons; "it is fastened to the ground, and by screaming loudly gives notice to the falconer, who is concealed, of the approach of a

hawk." You will notice in any picture of a shrike how admirably adapted is its curved beak for butchering purposes. The red-backed shrike "frequents the sides of woods and high hedgerows, generally in pairs, and may frequently be seen perched on the uppermost branch of an isolated bush, on the look out for prey. The males occasionally make a chirping noise, not unlike the note of the sparrow." It also imitates the voice of small birds. Mr. Yarrell says "the food of the red-backed shrike is mice, and probably shrews, small birds, and various insects, particularly the common May-chaffer. Its inclination to attack and its power to destroy little birds has been doubted; but it has been seen to kill a bird as large as a finch, and is not unfrequently caught in the clap-nets of London bird-catchers, having struck at their decoy-birds;" and Mr. Hewitson says—"Seeing a red-backed shrike busy in a hedge, I found, upon approaching it, a small bird, upon which it had been operating, firmly fixed upon a blunt thorn; its head was torn off, and the body entirely plucked."

"What an amazing quantity of little lady-bird beetles there are on this hedge-bank," said May. "The ground is almost red with them." Yes, it is a very common, but very pretty species. You see there are seven black spots on its red wing-covers, three on each, arranged triangularly, and one at the top of the wing-covers, just at the point where they meet. "Are these insects injurious, papa?" asked Willy; "you say there are so many insects that are. I do hope the little lady-birds do no mischief." I am happy, then,

to tell you that they are as useful as they are pretty. You all know what are called plant-lice, those nasty green or black flies called Aphides, which cover the leaves or branches of so many trees and flowers, and do most terrible mischief. Well, the lady-birds, both when they are larvæ and when they are beetles, eat these pests, and help to keep their devastating swarms in check. I have frequently seen an aphid in the mouth of a lady-bird; and the larva, a curious six-footed grub, about the third of an inch long, which you may often see late in the summer and the autumn, is still more fond of aphid food. Mr. Curtis says two lady-birds cleared two geranium plants of aphides in twenty-four hours. The species we are looking at is the "seven-spotted lady-bird;" there is another very common kind, whose scarlet wing-cases have one black spot on the centre of each. This species is subject to considerable variety; it is called the "two-spotted lady-bird." There is another you may often find; it is small and yellow, with eleven spots on each wing-cover. This is called the "twenty-two-spotted lady-bird;" it is an elegant little creature. It is interesting to note how the observation of some particular animal has led naturalists to the choice of their favorite study. Mr. Gould tells us that his first inclination to the study of birds arose from his father having once lifted him up to peep into a hedge-warbler's nest. His admiration for the beautiful blue eggs led him to devote his time to ornithology, or the study of birds. If I remember rightly, Kirby's mind was directed to the study of insects by noticing the wonderful vitality shown by a

little lady-bird beetle, which, after having been immersed twenty-four hours in spirits of wine, on being taken out actually flew away. "What is the meaning," asked Mary, "of the nursery rhyme about the lady-bird?"

Lady-bird, lady-bird, fly away home,
Your house is on fire, and your children will burn?"

Indeed, I cannot tell you. There are different versions of the old song. One runs thus:

Lady-bird, lady-bird, fly away home;
Your house is on fire, your children at home,
All but one that lives under the stone,—
Ply thee home, lady-bird, ere it be gone.

In Yorkshire and Lancashire it is—

Lady-bird, lady-bird, fly thy way home,
Thy house is on fire, thy children all roam,
Except little Nan, who sits in her pan,
Weaving gold laces as fast as she can.

The names of Lady-bird, Lady-cow, no doubt originated from the general reverence for this insect and its dedication to the Virgin Mary. In Scandinavia this little beetle is called "Our Lady's Key-maid;" in Sweden "The Virgin Mary's Golden Hen." Similar reverence is paid in Germany, France, England, and Scotland. In Norfolk it is called Bishop Barnabee, and the young girls have the following rhyme, which they continue to recite to it placed on the palm of the hand, till it takes wing and flies away.

"Bishop, Bishop Barnabee,
Tell me when my wedding be;

If it be to-morrow day,
Take your wings and fly away !
Fly to the East, fly to the West,
Fly to him that I love best."

The word barnabee or burnabee, or, as Southey writes it, burnie-bee, no doubt has reference to the burnished or polished wing cases of the insect.

Let us now look out for the coots and water-hens, which love to dabble amongst the weeds of these pools, and to hide amongst the hedges and bulrushes that so thickly skirt them. See how rapidly the swifts or "Jack-squealers," as the country folks call them, are gliding by; you remember when we were noticing the swallows and martins that we thought of the swifts. Look at the beautiful scythe-like form of the wings; the tail, you see, is slightly forked; but the bird has the power of bringing the feathers together, so that sometimes you cannot see its cleft form. I generally notice swifts in the neighbourhood about the 5th of May; this year Mr. John Shaw tells me he saw some in Shrewsbury as early as the 23rd of April. Although they come to us the last of the swallow family, they leave us the soonest. By the middle of August most of the swifts will have left us.

This bird has remarkably short legs; and I remember more than once taking one off the ground when I was a boy at school, for unless it is raised a little above the level of the ground, it finds it very difficult to mount upwards by reason of its extremely short legs and long wings. If we had a swift in our hands, I could point out how it differed from the rest of the swallow family

in the structure of its feet ; in the other members the four toes are arranged three before and one behind ; in the swift all the four toes are directed forwards. There is another kind of swift, the “white-bellied swift,” which has, on a few occasions, been noticed in this country. It is rather larger than the common swift, and has wings of greater length, and can fly even more rapidly. Hark ! I hear the noise of a coot proceeding from the reeds of a pond. I dare say if we keep quite still we shall get a glimpse of her. There she comes ; and do look, a lot of young ones with her ; little black downy things they are, as we should see were we near enough to examine them. The old birds have a naked white patch on the forehead, and are therefore called bald-coots. You can see the white patch now she faces us and the sun is shining ; the body is a dingy black tinged with dark grey ; you notice a little white about the wings. The feet of the coot are curiously formed, each of the four toes is partly webbed, having a membrane forming rounded lobes ; the claws are very sharp, and the bird does not hesitate to make use of them if you catch hold of it carelessly ; so Col. Hawker gives the following caution to young sportsmen—“Beware of a winged coot, or he will scratch you like a cat.”

I never saw a coot dive, and think it seldom does ; water-hens, every one knows, are frequent divers.

The old bird is pulling up some of the weeds of the pool for the young ones ; how carefully she attends to them ; the heads of the little ones are nearly naked, and of a bright orange colour mixed with blue ; but this brilliant colouring lasts only a few days. The nest

is made of broken reeds and flags, and hidden amongst the tall rushes and edges in the water.

Bewick mentions the case of a coot having built her nest among some rushes, which were afterwards loosened by the wind, and of course the nest was driven about and floated upon the surface of the water in every direction; notwithstanding which, the female continued to sit as usual, and brought out her young upon her movable habitation. Sec, now they have all gone away to hide amongst the reeds; they like to come out into the open water late in the evening, and it is not often easy to observe them in the day-time. There are plenty of moor-hens or water-hens in these reedy pools. They are not so peaceful as the coots, for they have been known to attack young ducklings. There one swims, jerking up its tail, which is whitish underneath, and nodding its head; the moor-hen is a smaller bird than the coot, though resembling it both in form and habits. The feet, however, are very different, for, instead of the toes being furnished with a lobed membrane, they have a continuous narrow one down each. Moor-hens have been known to remove their eggs from the nest, in order to add to it, and to replace them again. Mr. Selby relates the following interesting account:

“During the early part of the summer of 1835 a pair of water-hens built their nest by the margin of the ornamental pond at Bell’s Hill, a piece of water of considerable extent, and ordinarily fed by a spring from the height above, but into which the contents of another large pond can occasionally be admitted. This

was done while the female was sitting ; and as the nest had been built when the water-level stood low, the sudden influx of this large body of water from the second pond caused a rise of several inches, so as to threaten the speedy immersion and consequent destruction of the eggs. This the birds seem to have been aware of, and immediately took precaution against so imminent a danger ; for when the gardener, upon whose veracity I can safely rely, seeing the sudden rise of the water, went to look after the nest, expecting to find it covered and the eggs destroyed, or at least forsaken by the hen, he observed, while at a distance, both birds busily engaged about the brink where the nest was placed ; and when near enough, he clearly perceived that they were adding, with all possible dispatch, fresh materials to raise the fabric beyond the level of the increased contents of the pond, and that the eggs had by some means been removed from the nest by the birds, and were then deposited upon the grass, about a foot or more from the margin of the water. He watched them for some time, and saw the nest rapidly increase in height ; but I regret to add that he did not remain long enough, fearing he might create alarm, to witness the interesting act of the replacing of the eggs, which must have been effected shortly afterwards ; for upon his return in less than an hour, he found the hen quietly sitting upon them in the newly raised nest. In a few days afterwards the young were hatched, and, as usual, soon quitted the nest and took to the water with the parent. The nest was shown to me *in situ* very soon afterwards, and I could

then plainly discern the formation of the new with the old part of the fabric."

"What is that little bird in the water?" asked Jack. "Oh! he is suddenly gone; do you see the curl in the water where it dived?" It was no doubt a dabchick, then, from your description, though I was not in time to see it before it dived; if we keep quite still and silent I dare say it will appear again. There it is, dabbling in the water in search of water insects that are found amongst the weeds. Another name of this bird is the little grebe; several species of grebes have been found in this county; the great-crested grebe is a very handsome bird and frequents lakes and rivers; but of the five British grebes, the little dabchick is by far the most common. The feet of these birds are peculiar, the toes are not connected together by a web, as you see in ducks and geese; they are, however, united at the base, and each of the three front toes is surrounded by a broad continuous membrane; the lower part of the leg is also very flat; the legs are placed very far backwards, so that these birds stand almost upright; the wings are short and seldom used for flight; however, they are admirable swimmers and divers, and pretty, lively little birds. The plumage of this little grebe varies according to the time of year. Now, in the summer weather, the head, neck and back are a very dark brown; the cheeks and front of the neck a rich chestnut; chin jet black; in the winter they lose this chestnut colour, and are then of a light olive-grey colour and white underneath. Formerly the two different states of the plumage were thought to mark two different species.

The nest, as Mr. Gould tells us, is a raft of weeds and aquatic plants carefully heaped together in a rounded form. The young ones have delicate rose-coloured bills and harlequin-like markings on the body, and rosy-white breasts. "So active and truly aquatic is the dabchick, even when only one or two days old, that it is almost impossible to see it in a state of nature; for immediately after the young birds are hatched, they either take to the water of their own accord, or cling when not more than an hour old to the backs of their parents, who dive away with them out of harm's way." Mr. Gould mentions that a friend of his, when out on a fishing excursion with him, once shot a dabchick as it dived across a shallow stream; on emerging wounded, on the surface, two young ones clinging to the back were caught by Mr. Gould in his landing net.

So rapid is their diving that they can often avoid the charge of a gun; they then rise again "with only the tips of their bill above water, and even these generally concealed amongst some patch of weeds or grass." The grebes have a peculiar habit of plucking off the soft feathers from the under side of the body and swallowing them. Why they do so is not known.

"What is this pretty pink flower," asked May, "with long trailing stems and leaves broadly arrow-shaped? From its resemblance to that beautiful convolvulus in the garden I should think it must be a smaller kind of that plant." You are quite right, it is a convolvulus, and its English name of Field Bindweed is expressive of the clinging habits of this plant; see how tightly it

has wrapped itself round this tall blade of grass. Although a very pretty plant, with its pink flowers and



CONVOLVULUS.

darker plaits, its arrow-shaped leaves, and its fragrant smell, it is a troublesome weed to the farmer. Then there is the greater bind-weed, with its large bell-blossoms sometimes white as snow, sometimes striped with pink, sometimes almost rose-colour, so often seen growing profusely over the tallest bushes. Both kinds of bindweed, however, are mischievous weeds; the large kind you may find in flower as late as September. Some of the bindweed family, I ought to say, are valuable in medicine. There is for instance the *Convolvulus jalapa* and *Convolvulus scammonia*, both of which are extensively used in medicine; the former a South American plant and the latter a Syrian one. Then there is the so-called sweet-potato, which is the root of *Convolvulus batatas* used in China, Japan, and other tropical countries as a wholesome food. Strange it seems that plants so closely related should differ so much in their properties.

The accompanying vignette may be supposed to represent Master Willy watching the movements of a snail.



WALK VIII.

JULY.



LET us have another stroll on the moors. We pass over a small brook on our way, and of course stop on the bridge and gaze into the little rivulet. What do I see about four yards off in the shade? A number of small dark-coloured patches which I recognise at once as one of our most beautiful fresh-water algæ. We will gather some from the bottom. There! the little tufts are attached to the upper sides of stones. When taken out of the water, the plant looks and feels like a mass of very dark jelly. I will float a piece out in this bottle of water. Did you ever see anything more beautiful? It consists of a number of delicate branches, each arranged in a bead-like row, and from a certain resemblance which these beaded rows bear to frog-spawn, as well as from their jelly-like consistency, this alga has received the name of *Batrachospermum*, which means "frogs' spawn." If we take a bit home and spread it out carefully on a piece of drying paper, separating the numerous beaded branches one from the other with the point of a needle, and leave it to dry gradually, we shall get a very pretty object indeed. As you may suppose, the plant is a most charming object

for the microscope. "Do you think," asked Willy, "it would do in my aquarium?" I have several times tried it in an aquarium; it would live for a few days, then gradually lose colour and break to pieces. The fact is that, as Dr. Hassall says, these plants "inhabit mostly pure and running waters, being usually met with in fountains, wells, and streams, the force of which is not considerable." The frog-spawn alga, therefore, will not thrive in any but the purest water, and a gentle flow is necessary to its growth and health. "These plants are so exceedingly flexible," Dr. Hassall continues, "that they obey the slightest motion of the fluid which surrounds them, and would seem almost to be endowed with vitality; nothing can surpass the ease and grace of their movements. When removed from the water they lose all form, and appear like pieces of jelly without trace of organization. On immersion, however, the branches again quickly resume their former disposition. They adhere strongly to paper, and in drying frequently change to some other tint usually much deeper; on being moistened after long intervals they recover much of their original freshness; and it is even asserted that, after having lain in the herbarium for some years, when they are replaced in water in a suitable locality, they will vegetate as before." This last assertion I must say I do not credit. I shall never forget the delight I felt when I first made the acquaintance of this curious and graceful alga. From the eyes of how many people are its charms hidden! It is only those that look closely that would notice the little jelly-like tufts growing modestly in shaded places for the most part.

This species, however, is common enough in gently flowing and shallow streams, and we may often come across it in our rambles if we take the trouble to use our eyes. There are other extremely beautiful forms of fresh-water algæ.

Here in this same stream are the long green threads of *Cladophora glomerata*. I use as few hard words as possible, but I cannot help using them sometimes, as many objects have no English names. This alga is also attached to stones and floats out with the current sometimes two feet in length; and, like the frog-spawn alga, is fond of pure water, but I have often kept the *Cladophora* alive in perfect health in an aquarium for weeks together. Its deep refreshing green colour and graceful form make it a very desirable acquisition for the aquarium. I break off a small bit. Now see its beautifully branched form. Do you remember a round green ball about the size of a small apple which I have at home? Well, that ball, which came from Ellesmere, is nothing else than a mass of this same *Cladophora*. Dr. Hassall is no doubt correct in his explanation of the formation of these balls. He says, "This state of *Cladophora glomerata* I believe to be formed as follows: A specimen by the force of some mountain stream swollen by recent rains becomes forced from its attachment; as it is carried along by the current, it is made to revolve repeatedly upon itself, until at last a compact ball is formed of it, which finally becomes deposited in some basin or reservoir in which the stream loses itself, and in which these balls are usually found." Here are some specimens in the water of a rich brown

colour instead of green. This is caused by the growth of other algæ over its long branches. See! I shake a bit in my bottle, and you see a quantity of brown deposit comes off, showing the green threads of the *Cladophora* underneath. This brown deposit looks to you, I dare say, very uninteresting. I will show you some under the microscope when we get home, and you will see many extremely beautiful forms. These are known by the name of *Diatomaceæ* and *Desmidiæ*. I will not tell you more of them at present; but a picture which I will show you will give you the forms of some of these microscopic plants.

Here we are once more on the wild moors. There is really nothing very "wild" about them now; cultivation has turned them into excellent pasturage; the epithet, too, is a corruption of *weald*, signifying a wood. But this whole district, extending from Longdon-upon-Tern to Aqualate, was once, there can be no doubt, covered with water. Perhaps it was the bed of a large lake a great many years ago; the soil, you see, is composed of peat varying in thickness in different parts, and below the peat is often found sand and pebbles, which looks as if it was once the bottom of a vast lake ten miles or more long, and three broad. The village of Kinnorsly was evidently once an island, and you can now see the moors extending all around it. Once, then, the whole district was covered with water, but about 200 years ago it was covered with wood.

"Oh! papa, did you see that?" said Jack. "A hawk pounced upon a small bird and has taken him to that fir tree, where he is eating him." It is a kestrel;

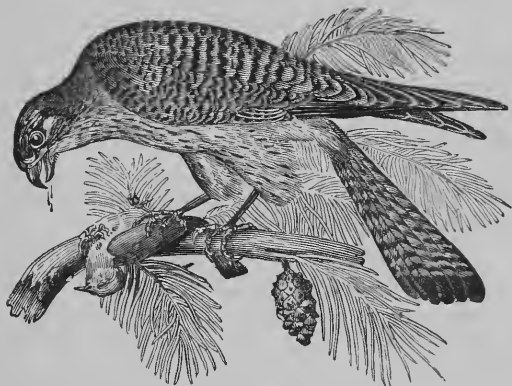


FRESH WATER ALGÆ, DESMIDEE, AND DIATOMACEÆ
All highly magnified.

1.—Staurastrum.
2.—Trigonocyclus.
3.—Staurastrum.
4.—Staurastrum.

5.—Diatoma.
6, 7.—Meridion.
8.—Eunotia.
9.—Exetastes.

one of the commonest of the British hawks, and which we may often see in this district; though I am afraid those destructive animals called gamekeepers will in time succeed in destroying every hawk in the neighbourhood. “Well, but, papa,” said Willy, “do they not do a great deal of harm to young partridges and pheasants, and of course the gamekeeper will not stand



KESTRIL.

that?” I dare say; indeed I have no doubt that a kestrel will occasionally seize upon a young partridge, but it is also certain that mice form the principal part of its food. Remains of mice, shrews, beetles, lizards, have been found in the kestrel’s stomach, and I am sure it would be a great pity to seek to exterminate this handsome and attractive bird. “Is this the hawk that you very often see hovering steadily in

the air over one spot?" asked May. Yes, it is, and from this habit it has got the name of windhover; the outspread tail is suspended and the head always points in the direction of the wind. The sparrow-hawk I occasionally see, and now and then the merlin, a beautiful little fellow and of great courage; the sparrow-hawk is a much greater enemy to young birds than the kestrel, and ought not to be allowed to increase where game or poultry are reared, for so bold are these birds that they will not unfrequently skim over a poultry yard, seize a young chicken and carry it off. Have you never heard the cry of terror an old hen utters when a hawk is seen in the air near her little brood?

Mr. Gould gives us the following anecdote of a sparrow-hawk as related to him by a friend:—

"Three or four years since I was driving towards Dover, when suddenly a sparrow-hawk, with a stoop like a falcon's, struck a lark close to my horse's head. The lark fell as a grouse or a partridge will fall to a falcon or tiercel, and the sparrow-hawk did not attempt to carry, but held on his way. I jumped down and picked up the body of the lark and the head; the two being entirely disunited. The velocity and force of the stoop must have been tremendous. I have often seen grouse and partridges ripped up the back and neck, and the skull laid bare, but I never saw a head taken clean off before." A sparrow-hawk has been known to pursue a finch between the legs of a man, and to dash through a window-pane with the intention of seizing some cage-bird.

“What was that very large bird, papa,” said Willy, “that you noticed near Eyton last November? It was one of the hawk family, was it not?” Yes; I have no doubt it was the common buzzard, though it would not allow me to get very near it; but I watched it at a distance for some time. It would remain on a tree for some time, and then take a slow flight away, returning again to some tree. Buzzards are not nearly such active fliers and bold birds as the smaller kinds of hawks. Though I said it was the common buzzard, you must not suppose that this bird is really common; it is called common as being the species most frequently seen in this country. Mr. Yarrell, in his book on ‘British Birds,’ has given the figure of a buzzard nursing and feeding a brood of young chickens. Is not that a curious thing?

He says, “The extreme partiality of the common buzzard to the seasonal task of incubation and rearing young birds has been exemplified in various instances. A few years back, a female buzzard, kept in the garden of the Chequers Inn, at Uxbridge, showed an inclination to sit by collecting and bending all the loose sticks she could gain possession of. Her owner, noticing her actions, supplied her with materials. She completed her nest and sat on two hens’ eggs, which she hatched, and afterwards reared the young. Since then she has hatched and brought up a brood of chickens every year.

She indicates her desire to sit by scratching holes in the ground, and breaking and tearing everything within her reach. One summer, in order to save her the fatigue of sitting, some young chickens just hatched

were put down to her, but she destroyed the whole. Her family, in June, 1839, consisted of nine, the original number was ten, but one had been lost. When flesh was given to her, she was very assiduous in tearing and offering it as food to her nurselings, and appeared uneasy if, after taking small portions from her, they turned away to pick up grain."

What is this little mouse-like thing in the grass? how quickly it runs. Now I have got him. No! off again; burrowing under the grass-roots. Now I have him safe enough; he cannot bite me with this glove on. Look at the little rogue, with his soft short silky fur and long nose. See how flexible that pointed nose is; how useful in grubbing amongst the closest herbage, or under the surface of the soil. How sharp are the little creature's teeth. With them he eats worms and the larvæ of various kinds of insects. Well, what is its name? It is the common shrew, and though the form of the body is mouse-shaped, it is, properly speaking, not a mouse at all, being much more nearly related to the mole. It is said that shrews are very fond of fighting, and that if two be confined together in a box, the stronger will conquer the weaker and then eat him. Moles are said to eat their small relatives, but I have never had any evidence of the fact, though it is probable enough. May wanted to know whether cats eat shrews. I have often tried cats with dead shrews, and have always found they will not touch them. I dare say, however, they would kill them. The smell of the shrew is certainly unpleasant, as you may find out from this little fellow I hold in my hand.

Mind he does not bite your nose. Now we have examined him I shall let him go. It is no pleasure to take an animal's life, and as this little shrew does no harm but good by destroying insect larvæ, it would be a shame to hurt him. Where injurious creatures must be killed, let us always be careful to take away life so as to cause the least possible pain. Now, would any of you have ever thought that the little shrew I have just released had ever been supposed to be one of the most dangerous enemies to cattle? This was really once believed by our ancestors, who thought that a shrew, by running over the backs of cattle, made them weak in the loins, and that its bite made a beast swell at the heart and die. Absurd as was the belief, the supposed cure for the injury was, if possible, still more ridiculous. It consisted in passing over the cow's back the twigs of a shrew ash. "Now a shrew ash," says Gilbert White, "is an ash whose twigs or branches when applied to the limbs of cattle will immediately relieve the pains which a beast suffers from the running of a shrew-mouse over the part affected, for it is supposed that a shrew-mouse is of so baneful and deleterious a nature, that wherever it creeps over a beast, be it horse, cow, or sheep, the suffering animal is afflicted with cruel anguish and threatened with the loss of the use of the limb. Against this accident, to which they were continually liable, our provident forefathers always kept a shrew ash at hand which, when once medicated, would maintain its virtue for ever. A shrew ash was made thus: into the body of the tree a deep hole was bored with an auger, and a poor devoted shrew-mouse

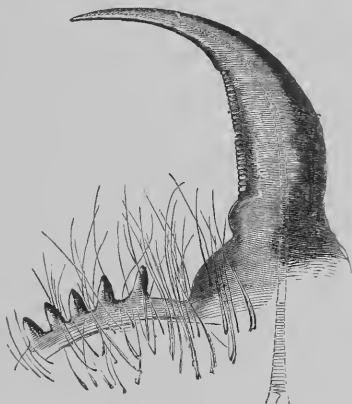
was thrust in alive, and plugged in, no doubt with several quaint incantations long since forgotten." It is marvellous how people could ever have believed such stuff; but equal absurdities are still accepted by many people to this very day; so strong a hold on men's minds have the kindred vices of superstition and ignorance.

Look at these spiders' webs on this hawthorn hedge, they are formed of delicate silken threads, and are of a long funnel shape; the spider occupies the bottom part and soon rushes up should any insect get into the trap, and quickly rushes down and escapes at the back door if your hand enters the front. The top of the funnel is spread out into large broad sheets, and the whole snare is attached by silken cords to the twigs of the bushes. This is the snare and residence of a good-sized species, the *Agelena labyrinthica*. Such webs are common on hedges, on grass, heath, and gorse. Now you must distinguish between spiders' nests and spiders' snares. The very common wheel-like webs, which you see abundantly on hedges, are snares or traps for insects, and beautiful they look on a dewy morning all strung with liquid pearls. Here under this oak are a number of old acorn-cups of last autumn's produce; the acorns have fallen out and the black cups remain. Do you see a delicate spider's web filling this cup; inside are a quantity of tiny round eggs, and a small spider is keeping guard within; this is a spider's nest. Many spiders spin cocoons for their little round eggs, place them in various situations, and leave them; others show the greatest care for them and carry them

about wherever they go. The cocoons of the species whose web or trap we are now looking at are made of strong white silk, each cocoon containing perhaps 100 round eggs, rather yellowish in colour. They are fastened to the inside of a web the spider spins by means of silken pillars formed by a number of threads closely glued together. The sac containing the cocoons is fastened to stems of grass or other objects, and partially hidden by a few withered leaves. "For the purpose of securing their prey," says Mr. Blackwall, the author of a splendid work on 'British Spiders,' "spiders have recourse to divers expedients. Numerous species run rapidly about in quest of those objects which constitute their food; others, approaching their victims with great circumspection, spring upon them from a distance; some lie concealed in flowers or among leaves, seizing such insects as come within their reach; and many species procure a supply of nutriment by means of complicated snares of their own fabrication." Of these snares the most beautiful, as I said, are the "wheel within wheel" nets of the various species of the family *Epëiridæ*. "What are those spider-like things," asked Willy, "with long thin bodies, you often see skating along the water? they are something like the spiders." They are not spiders at all, but insects called "water-measurers," from their peculiar habit of taking a short skate on the surface of the water and then stopping; having measured that distance, off they go again. However, many spiders do run along on the surface of the water, and you know there is one, the great water-spider, that

lives habitually in it. Some years ago I had one of these water-spiders in a glass vessel of water, and saw it spin its curious dome-shaped web which it attached to the sides of the glass and some weeds. These domes are formed of closely woven white silk, in the form of a diving bell or half a pigeon's egg, as De Geer has said, with the opening below. It looks like a half-ball of silver; this appearance is due to a quantity of air. It is, in fact, a huge air-bubble surrounded by a covering of white silk, and, as you may suppose, a very interesting and pretty object. Within this silver dome the spider places her eggs, perhaps a hundred or more in number, which are enveloped in a cocoon, this being attached to the inner side of the dome. "But how," said Jack, "is the bubble formed? Where does the air come from?" You have asked a very interesting question, and one which can be answered; for the question was set at rest by Mr. Bell, an excellent observer and well-known naturalist, about twelve years ago, if I remember rightly. He found that the old spider actually took the air down with her from the surface of the water, and deposited it in her domed house. I shall now quote Mr. Bell's words: "The manner in which the animal possesses itself of the bubble of air is very curious, and, as far as I know, has never been exactly described. It ascends to the surface slowly, assisted by a thread attached to a leaf or other support below and to the surface of the water. As soon as it comes near the surface it turns with the extremity of the abdomen upwards, and exposes a portion of the body to the air for an instant, then with

a jerk it snatches, as it were, a bubble of air, which is not only attached to the hairs which cover the abdomen, but is held on by the two hinder legs, which are crossed at an acute angle near their extremity; this crossing of the legs taking place at the instant the bubble is seized. The little creature then descends



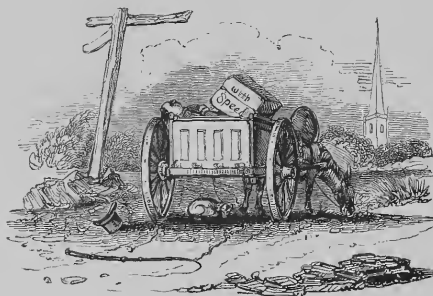
SPIDER'S FANG, MAGNIFIED.



SPIDER'S FOOT, MAGNIFIED.


more rapidly and regains its cell, always by the same route, turns the abdomen within it, and disengages the

bubble." Spiders have strong jaws; at the bottom of each hooked jaw there is a small sac which contains a poisonous fluid; this fluid is conveyed by a narrow channel from the sac along the jaw, and is pressed out at an opening or slit at the tip of the fang into the wound inflicted on its victim. The feet of spiders are generally terminated by two or more claws furnished with teeth; by means of these combs the animal is enabled to manage the threads of its web with great dexterity and efficiency.

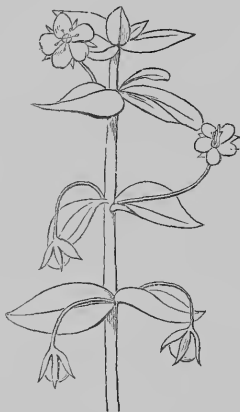


WALK IX.

JULY.

ET us be off to the fields once more; the sun is very hot, but we can find refreshing shade under the trees when we are tired. What is this beautiful little plant with bright scarlet flowers fully expanded? It is the scarlet pimpernel, or "poor man's weather-glass;" for on rainy days, and even before the showers are coming, the little plant, conscious of their approach, closes up its flowers. Other wild flowers, such as the convolvulus, close before rain. The little pimpernel, however, is supposed to be the best barometer. There is another thing about the pimpernel; you will not often see its blossoms expanded after three o'clock in the afternoon. In other countries, also, the regular closing of the flowers has been noticed. Dr. Seeman, who went as naturalist on one of the Arctic Expeditions, noticed the flowers to close during the long day of an arctic summer. "Although," he says, "the sun never sets while it lasts, the plants make no mistake about the time, when if it be not night it ought to be, but regularly as the evening hours approach, and when a midnight sun is several degrees above the horizon, they droop their leaves, and sleep even as they

do at sunset in more favoured climes." Look at the bright scarlet flower, with its small purple eye. Excepting poppies, with their dazzling brightness,



SCARLET PIMPERNEL.

I do not think there is another wild flower that has scarlet petals. However, the blossoms are not always scarlet; there is a white variety with a purple eye, and another having a dark blue blossom.

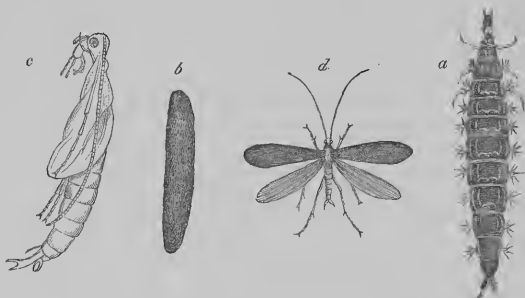
Well, Jack, you have found something, have you? Ah! this is a queer plant, it has queer habits, and a queer name; it is called "Jack-go-to-bed at noon." We sometimes call you after the name of another plant, "Jack-by-the-hedge." May, of course, is "May," or hawthorn blossom, and Robin at home, from his often tearing his clothes, is "Ragged Robin." Another name for the

plant you hold in your hand is goat's beard; the leaves are long and grass-like, the flowers bright yellow; it is not yet quite eleven o'clock, and the blossoms are expanded; they generally close about noon. Look at the colour of the stem, it has a kind of sea-green bloom upon it. Well, you would never find this plant with blossom expanded in the afternoon; so "Jack-go-to-bed at noon" is really not a bad name for it.

"And goodly now the noon-tide hour
When from his high meridian tower
The sun looks down in majesty.
What time about the grassy lea
The goat's-beard prompt his rise to hail
With broad expanded disc, in veil
Close mantling wraps its yellow head,
And goes, as peasants say, to bed."

Here we are at a stream; do you see those things at the bottom slowly moving? They seem to be bits of stick. "I know what they are," said Jack, "there is a good fat maggot in each of these cases; they are caddis-worms." Quite right, and in time they will change to insects. Here is another kind; the house is made of small bits of gravel, and it is attached to this smooth stone. I will break open the case; do you see inside is a long cylindrical case, with a thin covering; I slit this open with my penknife, and now you see the creature inside. There are a great variety of these caddis-worms, and most interesting it is to notice the different kind of houses they build. Some of the larvæ live in movable cases, as we have seen, some in fixed habitations; the materials, too, out of

which the different cases are constructed, are different, sometimes they are bits of gravel, or sand, wood, leaves, grass, the empty shells of various fresh-water molluscs. The fragments of stick and the small bits of gravel are held together by a kind of cement which the



a, b, c, d. Larva, cocoon, nymph, and insect of Caddis-fly.

larva spins from his mouth. Sometimes we may meet with cases made of sand, having on either side long slender bits of rush or stick. A lady once took a number of the larvæ out of their cases, and placed them in a vessel of water with various materials, such as coloured glass, cornelian, agate, onyx, brass filings, coralline, tortoiseshell; and these little maggoty things made use of and built their houses out of them. The perfect insect has four wings; and from these being closely covered with hairs, the order to which they belong has received the name of *Trichoptera*, which means "having hairy wings." You must know many of these insects; they are very common near ponds and

streams; generally they fly in a zig-zag fashion, and have the appearance of moths.

Ah! here is a splendid bed of the forget-me-not growing on this bank near the stream. Look at the blue enamel-like flowers, each with a yellow centre-eye; the leaves are bright green and rather rough. There are other species very much resembling this one you may often see in hedgerows and fields; but they are generally smaller plants; this one is the true forget-me-not. There are several stories about the origin of the name. Here is one:—Many years ago, a lady and knight were wandering by a river; the lady espied these bright blue flowers, on a small islet I suppose, in the deep river, and wished to possess them. Her lover immediately plunged in and plucked the plants, but the strength of the stream was too much for him on his return. With a great effort, however, he threw the flowers on the bank, exclaiming “Forget-me-not,” and sank!

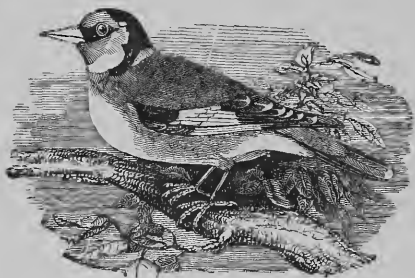
“But the lady fair of the knight so true
Still remember’d his hapless lot;
And she cherish’d the flower of brilliant hue
And she braided her hair with the blossoms blue,
And she call’d it ‘Forget-me-not.’”

We must proceed on our walk and not linger too long here, though, I must own, it is hard to tear oneself away from the banks of a gently-flowing river. So good-by to

“That blue and bright-eyed flowret of the brook,
Hope’s gentle gem, the sweet ‘Forget-me-not.’”

As we crossed the road we met two men with cage-

traps, and a slender twig covered thickly with bird-lime. In each cage-trap was a tame goldfinch, which were the decoy birds. The men had only succeeded in taking one goldfinch—for which they asked half a



GOLDFINCH.

crown. The decoy birds attract other goldfinches by their call-note; these sometimes alight on the trap, which instantly closes upon them; sometimes they alight on the twig smeared with bird-lime, which is so sticky that they cannot free themselves from it. "Gay plumage, lively habits, an agreeable form and song, with a disposition to become attached to those who feed them, are such strong recommendations, that the goldfinch has been, and will probably continue to be, one of the most general cage favourites. So well also do the birds of this species bear confinement, that they have been known to live ten years in captivity, continuing in song the greater part of each year. This tendency to sing and call make them valuable as brace-birds, decoy-birds, and call-birds, to be used by the

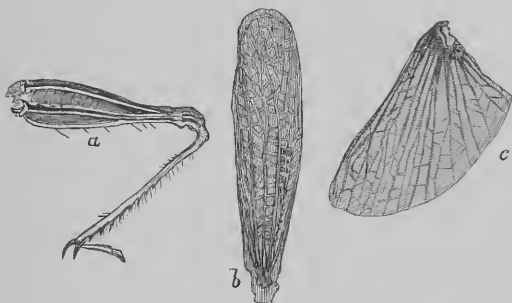
birdcatcher with his ground nets, while the facility with which others are captured, the numbers to be obtained, and the constant demand for them by the public, render the goldfinch one of the most important species included within the bird-dealer's traffic."

Mr. Mayhew says that a goldfinch has been known to exist twenty-three years in a cage. The same person tells us that goldfinches are sold in the streets of London from sixpence to a shilling each, and when there is an extra catch, and the shops are fully stocked, at threepence and fourpence each. Only think, it is computed that as many as 70,000 song birds are captured every year about London; the street sale of the goldfinch being about a tenth of the whole. Goldfinches may be taught to perform many amusing tricks, to draw up water for themselves by a small thimble-sized bucket, or to raise the lid of a small box to obtain the seed within. A goldfinch has been trained to appear dead; it could be held up by the tail or claw without exhibiting any signs of life, or to stand on its head with its claws in the air, or to imitate a Dutch milk-maid going to market with pails on its shoulders, or to appear as a soldier, keeping guard as sentinel. One was once trained to act as a cannoneer with a cap on its head, a firelock on its shoulder, and a match in its claw; it would then discharge a small cannon. "The same bird also acted as if it had been wounded. It was wheeled in a barrow, to convey it, as it were, to the hospital; after which it flew away before the company." Another turned a kind of windmill; another stood in

the midst of some fireworks, which were discharged all around it, without showing any fear. When we consider how docile and affectionate many birds become; when we think of their beauty and the sweet music they pour from their little throats; when we consider also of what immense use a great number of species are to man in helping to check injurious insects and caterpillars; does it not seem strange that they meet with so little protection? How often, as you know, we have met lads and great strong men with helpless fledglings in their hands, which they intend to torture in some way or other; perhaps they will tie strings to their legs and drag them about, or place them on a large stone and throw at them. To expostulate with them on the wickedness of such barbarous conduct is hopeless; one might as well quote Hebrew to a tadpole!

How noisy the grasshoppers are, with their incessant shrill chirpings; how thoroughly they enjoy the heat and sun! Just catch me one or two, Willy; there, one has hopped just before you; now he is on that blade of grass. Have you got him? No? Well, take this gauze net. Now you have him. "How does the grasshopper make that peculiar sound?" asked May. If you will get near one of these insects while he is making the noise you will see how he does it. There, one stands on that plantain stem. Do you see how briskly he rubs his legs against the wing-covers? Now he is quiet, and his legs are still; so it is evident that the friction or rubbing of the legs against the wings causes the sound. I rub the thigh of this

specimen I hold in my hands against the wing. You distinctly hear the shrill sound. It is the males only who make the noise; the females are mute. Some



a, b, c. Leg, wing-cover, and wing of Grasshopper, magnified.

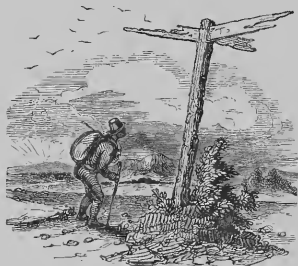
people have described another organ which seems to increase the sound. I have sometimes placed both field-cricket and grasshopper under a tumbler, and supplied them with moist blades of grass; it is curious to see how fast they eat them. You should remember that the grasshopper is a relative of the locust, to which, indeed, it bears a close resemblance; only the locust is a much larger insect. There are several species of locusts, and all are extremely injurious. You have read in the Bible of the fearful damage they are able to cause to the trees and various crops. It is seldom that locusts visit this country, happily, for there is not a greater insect scourge in existence. Our green grasshopper is also related to the cricket, so merrily noisy in dwelling-houses. Crickets are difficult to get rid of

when they have thoroughly established themselves in a house. Like many noisy persons, crickets like to hear nobody louder than themselves; and some one relates that a woman who had tried in vain every method she could think of to banish them from her house, at last got rid of them by the noise made by drums and trumpets, which she had procured to entertain her guests at a wedding. It is said, but you need not believe the story, that they instantly forsook the house, and the woman heard of them no more. Possibly some half dozen more women in the house would have had the same effect, without the musical instruments! What do you say to that idea, May? "That is too bad of you, papa, but you know you are only joking."

Here is a large pond, and from this bank we can look down into the water. There are some yellow water-lilies with their broad expanded leaves. I have noticed that the blossoms are often attacked by the larvæ of some two-winged flies. These flies lay their eggs within the petals, "lily-cradled" literally; the eggs hatch and the larvæ eat the cradle. I do not know more of these flies; I have often meant to trace their history, but have somehow forgotten to do so. Do you see that pike basking on the top of the water; how still and motionless he lies. He is a good-sized fish, at least I should say he was four pounds weight. "I wish we could catch him," said Willy. We have no tackle with us; besides, when pike are sunning themselves in that way on the top of the water, they are seldom inclined to take a bait. "What is the largest pike," asked Jack, "you ever saw caught?" The


largest I ever saw alive was caught in the canal about five years ago; it weighed twenty-one pounds, and was really a splendid fish. What voracious fish they are; they will often take young ducks, water-hens and coots, and will sometimes try to swallow a fish much too large for their throats. It is said that a pike once seized the head of a swan as she was feeding under water, and gorged so much of it as killed them both. The servants perceiving the swan with its head under water for a longer time than usual, took the boat and found both swan and pike dead. "Gesner relates that a pike in the Rhone seized on the lips of a mule that was brought to water, and that the beast drew the fish out before it could disengage itself. Walton was assured by his friend Mr. Segrave, who kept tame otters, that he had known a pike, in extreme hunger, fight with one of his otters for a carp that the otter had caught and was then bringing out of the water. A woman in Poland had her foot seized by a pike as she was washing clothes in a pond." Mr. Jesse tells the story of a gentleman, who, as he was one day walking by the side of the river Wey, saw a large pike in a shallow creek. He immediately pulled off his coat, tucked up his shirt sleeves, and went into the water to intercept the return of the fish to the river, and to endeavour to throw it out upon the bank by getting his hands under it. During this attempt the pike, finding he could not make his escape, seized one of the arms of the gentleman, and lacerated it so much that the marks of the wound were visible for a long time afterwards. Pike will live to a great age, ninety years

or more. In the year 1497, according to old Gesner, a pike was taken at Halibrun in Suabia with a brazen ring attached to it, on which was the following inscription in Greek :—"I am the fish which was put into the lake by the hands of the governor of the universe, Frederick the Second, the 5th of October, 1230." This pike, therefore, would be two hundred and sixty-seven years old ; people said it weighed three hundred and fifty pounds, and that its skeleton was nineteen feet long. I will show you a picture of this ring in Gesner's book when we get home.



WALK X.

OCTOBER.

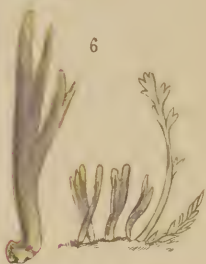
OW pleasant is the season of autumn, with its yellow fields of ripe corn, and its orchards laden with the fruits of the apple and the pear. But now the golden grain is safely stored. The birds, too, have done singing, with the exception of the robin and the hedge-warbler, which even in the winter occasionally cheer us with their welcome notes. There are yet, however, a few wild flowers to interest us, and the ferns are still beautiful. The various kinds of fungi are springing up in the fields and woodlands; it is a charming day for a stroll; we will drive to the Wrekin and explore the woods at its base. I am sure we shall be able to meet with many pretty forms. The woods are rendered extremely beautiful by the rich autumnal tints of the foliage. We will go through this wicket and follow the path in the direction of Ten-Tree Hill. Now, who will be the first to find the bright scarlet fly agaric? It is a poisonous species, though so beautiful. We will put the wholesome fungi in one basket and the suspected ones in another.

Here you see is the elegant parasol fungus, with its tall stem and top spotted with brown flakes; it is a most delicious one to eat, and in my opinion is superior to

the common mushroom. "Shall we find the beefsteak fungus, papa?" said Willy. I have never seen it growing here; the beefsteak fungus prefers to grow on very old oak trees, and it is, moreover, by no means common. It is so called from its resemblance to a beefsteak when cut through; a reddish gravy-like juice flows from the wound, and I think the whole fungus when young very inviting. I have on three or four occasions eaten this species, but I do not think it a very palatable one, though perfectly wholesome and doubtless nutritious.

Here is a quantity of *Amanita phalloides*, very beautiful with its green tints and white stem; but I should not like to eat any of this kind. Do you notice what a very unpleasant smell it has?

What a number of animals are nailed to that beech-tree! Let us see what they are: two cats, three weasels, two stoats, four jays, two magpies, two kestrels, an owl, and a sparrow-hawk. The keeper has trapped or shot these as enemies to the game, and no doubt, with the exception of the weasels, owl, and kestrels, the other animals often destroy young pheasants or suck their eggs. Still I should not like to see all wild animals destroyed that occasionally harm game preserves. Gamekeepers have strong affection for their hares, partridges, and pheasants, and consider all other wild animals as either enemies or beneath notice. Indeed, a gamekeeper's zoology is confined to five things—pheasants, partridges, hares, rabbits, and ants' eggs. Ah! I do think I espy about twenty yards ahead the fly agaric (*Amanita muscaria*). To be sure, here



FUNCI.

- 1.—Beef-steak Fungus.
- 2.—Latticed Stinkhorn (very rare.)
- 3.—Boletus
- 4.—Honeycomb Mushroom.

- 5.—Fly Agaric
- 6.—Clavaria
- 7.—Bird's-nest Fungus: b, view of otto magnified.

is a fine lot; some just appearing above ground in the form of scarlet balls; others fully expanded. How splendid they are! You notice many white patches on their tops; let us see how these patches are formed. Here is a specimen hardly showing itself. I will dig it up. There, now you see; the whole fungus is wrapped up in a thin white envelope; this is called a *volva*, from the Latin word *volvo*—"I roll up." When the *volva* breaks, it leaves scattered patches on the top. The gills are white or yellowish and the stem is bulbous. This is not a very common fungus; it is, however, frequent enough in the woods about the Wrekin. The effects of this fungus on a person who has eaten it are of an intoxicating nature. Dr. Badham, who used to eat various kinds of fungi and has written a very good book on wholesome kinds, once gathered some specimens of the fly agaric. He sent them to two lady friends, intending to call soon afterwards and explain that he had sent them on account of their extreme beauty solely. Dr. Badham did not come, but these two ladies said, "Oh, of course Dr. Badham would never send us anything unwholesome; let us have some cooked for tea." So they had some cooked and ate thereof, and were taken very ill. The bad effects, however, soon passed away. Look at that little squirrel, see how nimbly he climbs the tree; now he hides on a forked branch and thinks we do not see him. Well, I must not forget to tell you that this fungus, growing in this spot so plentifully, is called fly agaric because a decoction of it was once used to destroy flies. The people in Siberia swallow portions of it to produce intoxication. Here

is another species closely related to the one we have been considering, and not unlike it in form; this is the blushing agaric (*Amanita rubescens*); you see its top also is covered with whitish flakes or warts; and persons who are not in the habit of noticing differences might confuse this species with the other. Now look; I will cut this specimen through with my knife, and bruise it slightly; do you see how it changes to a reddish hue, thus at once distinguishing itself from its unwholesome relative? This quality gives the name to the fungus. The blushing agaric is perfectly wholesome. You remember how often we had it cooked last autumn, and how delicious it was both for breakfast and dinner. I would never, however, advise persons who have not paid attention to the study of fungi to gather and eat them without asking the opinion of some one who had knowledge of the subject; and I am sure that you, children, will never think of eating any kind that you have not first brought to me. There sits the squirrel. Let us make him show us how he can leap from one bough to another. I clap my hands and Jack throws a stone, and off the little fellow goes, taking wonderful leaps. As the winter approaches the squirrel will be busy laying up stores for consumption during that season, such as nuts, acorns, and beech-mast. For the greater part of the winter the squirrel is dormant; on fine warm days, however, he ventures out of his retreat in the hole of a tree, visits his cupboard, cracks a few nuts, and then goes to sleep again. The nest of the squirrel is made of moss, leaves, and twigs curiously intertwined, and is generally placed

between the forked branches; the young ones, two or three in number, are born in the month of June. A gentleman, in a letter to Mr. Jenyns, says "a pair which frequented a tree opposite the window of one of the rooms, evinced great enmity to a couple of magpies with whom they kept up a perpetual warfare, pursuing them from branch to branch, and from tree to tree with untiring agility. Whether this persecution arose from natural antipathy between the combatants, or from jealousy of interference with their nests, is not known."

What are those black circular spots some four or five yards in diameter, so common in the woods of the Wrekin? They are places where wood has been burnt for charcoal. Always examine such spots, as you may find rare plants growing upon them which scarcely grow anywhere else. Here, for instance, is *Flammula sapinea* abundant. On these charcoal spots this fungus delights to grow, and I do not think you will find it elsewhere. Mr. Worthington Smith tells us it is a very rare British fungus; it is not mentioned in Mr. Berkley's 'Outlines of Fungology.' Here is a beautifully marked variety of *Polyporus perennis*, also very rare; it is tinted with rich sienna, chocolate, and black; it is found only in these charcoal rings. Let us go farther on. Look at that splendid bright, orange-yellow fungus growing amongst the moss in large tufts as it were. Each plant has a tender stem with short branches; what a number are growing together with roots or lower portions of the stem closely intertwined! This is *Clavaria fastigiata*. Here we meet with the sticky *Gomphidius viscidus*, and here with the handsome

Tricholoma scalpturatus, and the lovely *T. rutilans*. I am obliged to use Latin names as there are no English ones. The ground here is covered with the small *Clitocyle fragrans*; it smells like newly-mown hay. And now we meet with various *Boleti*. Look at the under surface; you see it is riddled with numerous small holes, very unlike the gills of the mushroom and all agarics. We shall find *Boletus luteus*, *B. flavus*, *B. edulis*, *B. scaber*, the handsome but poisonous *B. luridus*. *Boletus edulis* is, as its name imports, very good to eat and perfectly wholesome; so, too, is *B. scaber* and *B. luteus*. Holloa! what bird has just fled before us? it is a woodcock evidently, and has probably lately arrived in this country from the south of Europe, though woodcocks occasionally reside here all through the year. The woodcock is a very handsome bird with its dark mottled brown plumage, long bill, and large, full, black eyes. "What do these birds feed upon?" asked Willy. You often hear people say "they live upon suction," and "do not eat any food." That I fancy is a common belief amongst sportsmen. It is, however, altogether a mistake; for these birds eat quantities of earthworms, as has frequently been witnessed. I will give an instance of this in the case of a woodcock kept in an aviary somewhere in Spain. "There was a fountain perpetually flowing to keep the ground moist and trees planted for the same purpose; fresh sod was brought to it, the richest in worms that could be found. In vain did the worms seek concealment; when the woodcock was hungry it discovered them by the smell, stuck its beak into the

ground, but never higher than the nostrils, drew them out singly, and raising its bill into the air, it extended upon it the whole length of the worm, and in this way swallowed it smoothly without any action of the jaws. This whole operation was performed in an instant, and the action of the woodcock was so equal and imperceptible that it seemed doing nothing; it never missed its aim; for this reason, and because it never plunged its bill beyond the orifice of the nostrils, it was concluded that the bird was directed to its food by smell." There is one very interesting point in the natural history of the woodcock which I must not forget to mention. The old birds sometimes carry their little ones from the place where they are hatched down to soft marshy places to feed on the worms and insect larvæ found there; they take them in the evening and return with them in the morning. "But how do they carry them?" asked May. Some observers have said they are carried in the claws, but Mr. St. John maintains that the little birds are clasped tightly between the thighs.

"Is it not a difficult thing to tell the difference between the male and female woodcock?" asked Willy. Yes, I do not think it is possible in every case to tell the difference; the male bird is smaller than the female of the same age, and there are slight differences in the colour of the plumage, but as you may meet with birds of different ages, and as woodcocks are much subject to variation of plumage, it is difficult to pronounce whether this woodcock is a male and that a female.

"Oh, papa, what are these ring-marks on the end

of this bit of timber upon which we are sitting?" said Willy. These rings or zones represent the various growths made every year by the tree when it was growing, each zone being the produce of one year. As the wood ceases to grow for some months in the winter, a distinction in appearance between the last wood of a former and the first wood of the succeeding year is occasioned; so that, in our own country at least, the age of a tree can be ascertained within some limit by counting the number of zones; there is, however, great difference in the size of the same species of trees, even of the same age, and great difference too in the width of the zones; indeed, you can see this in the case of the wood we have been sitting upon. See how the zones differ, how broad some are, how narrow are others; nay, even in one year you see how the zone varies. The subject of the growth of trees is very interesting, and I would advise you, when you get older, to pay some attention to it.

Here is another fungus, and a species which I am very glad to find in the Wrekin woods, though it grows but sparingly. Take it up; turn it over. How curious! the under side is not a series of gills, as in *Agaricus*, nor a substance perforated by a number of little holes, as in *Boletus*. It is formed of a quantity of delicate white teeth or spines; see how beautiful they are and how easily broken. The spines are exactly like miniature awls. It is called from the prickly appearance of the under surface, or *hymenium*, the hedgehog mushroom (*Hydnum repandum*). "Is it

good to eat?" asked Jack. It is, in my opinion, one of the most exquisite fungi that grows, and the most curious thing about it is that its flavour very strongly resembles oysters. Last year we had some of these fellows cut up in bits about the size of a bean and stewed in white sauce; the sauce we ate with a beefsteak at dinner, and I do think that as far as flavour is concerned one might almost pass it off as oyster sauce without any one finding it out. Not that the hedgehog-mushroom-sauce is really as good as oyster sauce, but, as I said, the flavour strongly reminds one of it, nor do I think that any fungi, delicious as they are, can ever come up to oysters, the *ne-plus-ultra* of exquisite food.

It is getting towards evening and we must not linger much longer. How many eatable fungi have we got? let me count. *Lepiota procera*, *Amanita rubescens*, *Hydnum repandum*, and *Marasmius oreades* which we gathered in the meadow before we entered the wood. We will take them home, they will come in very well either at breakfast or at dinner time. The other fungi we will also take home and compare them with the descriptions and drawings in my books.

And now our rambles are ended; we have seen there is much to notice, much to admire. Let us never forget our great Creator who has made all the beautiful things we see around us; let us learn this lesson from the contemplation of the works of the Almighty—that as all created things are fulfilling their appointed

work, so we too should fulfil ours, and by obedience, diligence, kindness, and patience show our love of Him for whose "pleasure all things are, and were created."

